SAP education

40 CELEBRATING YEARS

LEARNING MATHEMATICS 5

For Primary Levels

- Direct complement to the current school textbook
- Topical approach for systematic learning
- Learning objectives highlighted within chapters
- Ample exercises for extensive coverage
- Additional digital resources to complete learning experience
- Complete worked solutions

Enhanced Learning

FREE resources available
Download **My SAPeducation App**
or go to **www.sapgrp.com**

- Review exercises
- Non-routine questions to develop strategies for problem solving
- Revision Tests for progressive assessment with Geniebook

ADAPTIVE LEARNING with ANALYTICS INTELLIGENCE

Perfect your skills and eliminate your weaknesses intelligently with Geniebook

Marked by Experienced Teachers

Eliminate Weaknesses Intelligently

Learn with Full Explanations

BASED ON THE LATEST CURRICULUM
ALL NEW
NEW EDITION

Download **My SAPeducation App** Now!

Download on the App Store | GET IT ON Google Play | **My SAPeducation** Enhance your learning experience with our App! | Like us on Facebook! Singapore-Asia-Publishers

LEARNING MATHEMATICS 5

For Primary Levels

Authors
Alan Tan
B.Sc.

Norrin Hasim
B.A. PGDE

Project Editor
Alan Tan

Name: _____

Class: _____

Learning Mathematics Book 5

First Edition 2018

Published and Distributed by:

Singapore Asia Publishers Pte Ltd
219 Henderson Road #10-04
Henderson Industrial Park
Singapore 159556
Tel : +65 6276 8280
Fax : +65 6276 8292
Email: info.sg@sapgrp.com
Website: www.sapgrp.com
Facebook: Singapore-Asia-Publishers

ISBN-13 978-981-3210-05-9
ISBN-10 981-3210-05-2

Printed in Singapore

SAP Global Partners' Network:

Antigua & Barbuda	Ghana	Namibia	Saint Lucia
Australia	Grenada	Nepal	Saint Vincent & the Grenadines
Bahrain	Guyana	New Zealand	South Africa
Bangladesh	Hong Kong	Nigeria	South Korea
Barbados	India	Pakistan	Syria
Bhutan	Indonesia	Papua New Guinea	Taiwan
Bostwana	Jamaica	Philippines	Tanzania
Brazil	Japan	Poland	Thailand
Brunei	Laos	Portugal	Trinidad & Tobago
Cambodia	Lebanon	Qatar	United Arab Emirates
Canada	Macau	Rwanda	United Kingdom
Chile	Malaysia	Saudi Arabia	United States of America
China	Malawi	Seychelles	Vietnam
Colombia	Maldives	Singapore	Zambia
Egypt	Mauritius	Solomon Islands	Zimbabwe
Fiji Island	Myanmar	Sri Lanka	

For international business enquiries, email **ibg@sapgrp.com**

www.sapgrp.com

Preface

Learning Mathematics Book 5 is a comprehensive workbook that provides students with ample practice on various mathematics question types.

How is this book helpful to students?

Summary of Learning Objectives
Refer to the overview of the topics in the book, which sets the pace for learning each topic.

Work Performance Table
Progress record for self-assessment and evaluation.

Formulae Sheet
Check and recall the essential and critical mathematical formulae and information for each topic.

Topical Exercises
Work on these questions to become familiar with various question types.

Enhanced Learning

FREE resources available
Download **My SAPeducation App**
or go to **www.sapgrp.com**

Review Papers / Revision Tests
Test yourself! This is the best way to assess your understanding of the topics taught and learnt.

Geniebook® Let Geniebook mark and analyse your answers to receive personalised practice questions! (Refer to first page for more information.)

Non-routine Questions
Understand heuristics better. Try these non-routine questions to develop your thinking and analytical skills.

Additional Activities
Try these activities that test your understanding of mathematical concepts.

Step-by-step Solutions
Learn from the carefully worked out solutions included at the back of the book.

Through this comprehensive workbook, students can gain a thorough understanding of mathematical concepts, hone their problem-solving skills and develop creative and critical thinking skills. This book will inspire confidence as the student progresses.

The Editorial Team

Contents and Learning Objectives

Work Performance

	UNIT		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
Whole Numbers	1	• Count and write numbers within 10 million in numerals and words	☐/5	☐/5	☐/5	☐/10	☐/10	☐/10	☐/20			
Operations of Whole Numbers	2	• Perform multiplication of tens, hundreds, thousands and their multiples	☐/9	☐/18	☐/27							
		• Perform division of tens, hundreds, thousands and their multiples	☐/15	☐/28	☐/24							
		• Perform order of operations	☐/20									
		• Solve word problems related to whole numbers	☐/34									
Fractions and Mixed Numbers	3	• Make a connection between fractions and division	☐/10	☐/10								
		• Convert fractions to decimals	☐/10									
		• Add and subtract mixed numbers	☐/10	☐/10								
Multiplying Whole Numbers, Fractions and Mixed Numbers	4	• Find the product of fractions and whole numbers	☐/10									
		• Find the product of proper fractions	☐/10									
		• Find the product of proper and improper fractions	☐/10									
		• Find the product of improper fractions	☐/10									
		• Find the product of mixed numbers and whole numbers	☐/10									
Word Problems on Fractions	5	• Solve word problems related to fractions	☐/53									
Area of Triangles	6	• Identify the base and height of a triangle	☐/8	☐/8								
		• Apply the formula to calculate the area of triangles	☐/10									
		• Find the area of shaded triangles and composite figures	☐/27									
Ratio	7	• Find ratio and equivalent ratio of two or three given quantities	☐/27	☐/10								
		• Reduce a ratio to its simplest form	☐/10									
		• Solve word problems related to ratio	☐/17	☐/22								

	UNIT		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
Volume of Cubes and Cuboids	8	• Compare the volumes of solids	/10									
		• Calculate the unit cubes in a solid	/16									
		• Draw a cube or cuboid on dot paper	/5	/5	/15							
		• Find volume of a solid using formula	/16	/12	/8							
		• Convert volume between cm^3, l and ml	/10	/10								
		• Solve word problems related to volume of cube and cuboid and volume of liquid	/20									
Decimals	9	• Multiply and divide decimals by tens, hundreds, thousands and their multiples	/25	/25								
		• Convert metres to centimetres, kilometres to metres, kilograms to grams and litres to millilitres	/28									
		• Convert centimetres to metres, metres to kilometres, grams to kilograms and millilitres to litres	/28									
		• Solve word problems related to decimals and measurements	/27									
Percentage	10	• Understand percent	/10	/5								
		• Convert percentage to decimals or fractions	/20									
		• Convert decimals or fractions to percentage	/10	/10								
		• Convert part of a quantity to percentage	/15									
		• Calculate percentage based on quantity, and vice versa	/17									
		• Solve word problems related to percentage	/25									
Average	11	• Understand the concept of average	/12									
		• Calculate average	/20									
		• Calculate total number based on average and number of items given	/8									
		• Solve word problems related to average	/36									
Rate	12	• Understand rate	/5									
		• Solve word problems related to rate	/10									
Angles	13	Recognise and understand angles on a straight line, angles at a point and vertically opposite angles	/60	/12								
		• Use angle properties to find unknown angles	/16									
Triangles	14	• Classify triangles	/5	/5								
		• Recognise and find unknown angles in different triangles: right-angled, isosceles and equilateral triangles	/10	/11	/12							
		• Draw triangles	/8	/6								
Quadrilaterals	15	• Classify quadrilaterals	/5									
		• Recognise and find unknown angles in a parallelogram, rhombus and trapezium	/26									
		• Draw quadrilaterals	/6	/10								

Formulae Sheet

Unit 1 Whole Numbers

numerals	words
1	one
10	ten
100	one hundred
1000	one thousand
10 000	ten thousand
100 000	one hundred thousand
1 000 000	one million
10 000 000	ten million

Unit 2 Operations of Whole Numbers

Shortcuts for multiplying numbers by 10, 100 and 1000

When multiplying numbers by 10, add a zero after the number: $81 \times 10 = 810$.

When multiplying numbers by 100, add two zeros after the number: $81 \times 100 = 8100$.

When multiplying numbers by 1000, add three zeros after the number: $81 \times 1000 = 81\,000$.

Shortcuts for dividing numbers by 10, 100 and 1000

When dividing numbers ending with 0 by 10, remove a zero: $810 \div 10 = 81$.

When dividing numbers ending with 00 by 100, remove two zeros: $8100 \div 100 = 81$.

When dividing numbers ending with 000 by 1000, remove three zeros: $81\,000 \div 1000 = 81$.

Rules for order of operations

- Brackets – work out operations in brackets first
- Multiplication and Division – work out operations involving multiplication and division before addition and subtraction
- Addition and Subtraction – work out operations involving addition and subtraction last

* If the sum involves only addition and subtraction or only multiplication and division, work from left to right.

Unit 3 Fractions and Mixed Numbers

Fractions and division

$$\frac{\text{Numerator}}{\text{Denominator}} = \text{Numerator} \div \text{Denominator}$$

Fractions to decimals

Some fractions can be converted to tenths, hundredths and thousandths first before converting to decimals.

Examples: $\frac{1}{2} = \frac{5}{10} = 0.5$

$\frac{6}{25} = \frac{24}{100} = 0.24$

$\frac{16}{125} = \frac{128}{1000} = 0.128$

When fractions cannot be converted to tenths, hundredths or thousandths, use long division to convert fractions to decimals.

Example:

$\frac{5}{9} = 5 \div 9 \approx 0.56$ (2 decimal places)

Convert improper fractions to decimals

Convert improper fractions to whole numbers and proper fractions first.

Use long division to convert proper fractions to decimals.

Add decimals to whole numbers to get the answers.

Example:

$$\frac{13}{9} = \frac{9}{9} + \frac{4}{9}$$
$$\approx 1 + 0.44 \text{ (2 decimal places)}$$
$$= 1.44$$

Convert mixed numbers to decimals

Separate whole numbers and fractions in the mixed numbers.

Use long division to convert fractions to decimals.

Add decimals to whole numbers to get the answers.

Example:

$$4\frac{1}{6} = 4 + \frac{1}{6} \approx 4 + 0.17 \text{ (2 decimal places)}$$
$$= 4.17$$

Adding and subtracting mixed numbers

- Make the unlike fractions common first.
- Add or subtract the whole numbers.
- Add or subtract the fractions.

- If the final fraction becomes improper after adding, make it a proper fraction. Remember to add to the whole number.

  Examples:

$$1\frac{2}{3} + 2\frac{3}{4} = 1\frac{8}{12} + 2\frac{9}{12} = 3\frac{17}{12}$$
$$= 3 + \frac{12}{12} + \frac{5}{12}$$
$$= 4\frac{5}{12}$$
$$2\frac{3}{4} - 1\frac{2}{3} = 2\frac{9}{12} - 1\frac{8}{12}$$
$$= 1\frac{1}{12}$$

Things to note when using a calculator for fractions

Use $a\frac{b}{c}$ when keying fractions.

Examples:

$\frac{1}{2}$ Press [C] [1] [$a\frac{b}{c}$] [2]

$3\frac{1}{5}$ Press [C] [3] [$a\frac{b}{c}$] [1] [$a\frac{b}{c}$] [5]

Unit 4 Multiplying Whole Numbers, Fractions and Mixed Numbers

Finding the product of fractions and whole numbers

Multiply the numerator of the fraction by the whole number.

Divide the product by the denominator of the fraction.

Express the final answer in its simplest form.

Example:

$$\frac{1}{4} \times 12 = \frac{1 \times 12}{4}$$
$$= \frac{12}{4}$$
$$= 3$$

Finding the product of fractions

Multiply the two numerators.

Multiply the two denominators.

Express the final answer in its simplest form.

Example:

$$\frac{1}{2} \times \frac{2}{3} = \frac{1 \times 2}{2 \times 3}$$
$$= \frac{2}{6}$$
$$= \frac{1}{3}$$

Alternatively, when there is a common factor between the numerators and denominators, we can divide accordingly to make the final answer simpler. However, there are some things to take note when doing this.

Divide only when there is a common factor between the

- numerator and denominator in a fraction
- numerator of a fraction and denominator of another fraction

  Example:

$$\frac{1}{\cancel{2}_{1}} \times \frac{\cancel{2}^{1}}{3} = \frac{1}{3}$$

Finding the product of mixed numbers and whole numbers

Convert the mixed number into an improper fraction.

Multiply the numerator of the fraction by the whole number.

The denominator remains the same.

Express the final answer in mixed number.

Example:

$$1\frac{2}{3} \times 10 = \frac{5}{3} \times 10$$
$$= 5 \times \frac{10}{3}$$
$$= \frac{50}{3}$$
$$= 16\frac{2}{3}$$

Unit 6 Area of Triangles

In a triangle, its height is always perpendicular to its base.

Area of triangle = $\frac{1}{2}$ × base × height

Unit 7 Ratio

Ratio is used to show comparison between two or three quantities.

Note that ratio may not be the actual quantities being compared.

To obtain an equivalent ratio, multiply ratio by a common factor.

Similarly, we can divide ratio by a common factor to reduce it to its simplest form.

Unit 8 Volume of Cubes and Cuboids

1 ℓ = 1000 mℓ = 1000 cm^3

Volume of cube = Edge × Edge × Edge

Volume of cuboid = Length × Breadth × Height

Unit 9 Decimals

To multiply decimals by

10, move decimal point 1 place to the right

100, move decimal point 2 places to the right

1000, move decimal point 3 places to the right

Examples:

1.234 × 10 = 12.34

1.234 × 100 = 123.4

1.234 × 1000 = 1234

To divide decimals by
10, move decimal point 1 place to the left
100, move decimal point 2 places to the left
1000, move decimal point 3 places to the left

Examples:

$8765 \div 10 = 876.5$

$8765 \div 100 = 87.65$

$8765 \div 1000 = 8.765$

metres to centimetres = × 100
kilometres to metres = × 1000
kilograms to grams = × 1000
litres to millilitres = × 1000

centimetres to metres = ÷ 100
metres to kilometres = ÷ 1000
grams to kilograms = ÷ 1000
millilitres to litres = ÷ 1000

Unit 10 Percentage

fraction to percentage = fraction × 100

Example:

$\frac{1}{10} \times 100 = 10\%$

decimal to percentage = decimal × 100

Example:

$0.1 \times 100 = 10\%$

percentage to fraction = $\frac{\text{number in percentage}}{100}$

(Remember to express in the simplest form.)

Example:

$10\% = \frac{10}{100} = \frac{1}{10}$

percentage to decimal = percentage ÷ 100

Example:

$10\% = 10 \div 100 = 0.1$

To find the percentage of a quantity, multiply percentage by total quantity.

Example:

$20\% \text{ of } 200 = 20\% \times 200$

$= \frac{20}{100} \times 200$

$= 40$

To find GST, multiply 7% by price of the item.
To find total cost with GST, add GST to price of the item.

Example:

Price of bag before GST = $100

$GST = 7\% \times \$100$

$= \frac{7}{100} \times 100$

$= \$7$

Price of bag after GST = $100 + $7
= $107

To find the amount of discount, multiply discount percentage by usual price of the item.
To find the final price, subtract amount of discount from usual price of the item.

Example:

Usual price of bag before 20% discount = $100

Amount of discount = $20\% \times \$100$

$= \frac{20}{100} \times 100$

$= \$20$

Final price of bag after discount = $100 – $20
= $80

To find amount of interest, multiply interest rate by principal amount.
To find the final amount, add amount of interest to principal amount.

Example:

Amount of savings before 5% interest rate = $500

Amount of interest = $5\% \times \$500$

$= \frac{5}{100} \times 500$

$= \$25$

Final amount of savings = $500 + $25
= $525

Unit 11 Average

average = total number ÷ number of items
total number = average × number of items

Unit 13 Angles

Properties of angles

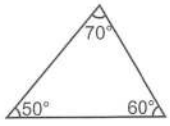
- Sum of angles on a straight line is 180°.
- Sum of angles at a point is 360°.
- Vertically opposite angles are equal.

Unit 14 Triangles

Property of a triangle

- The sum of all angles in the triangle is 180°.

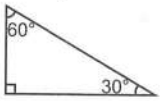
Example:



$50° + 60° + 70° = 180°$

Properties of a right-angled triangle
- One angle is 90°.
- The sum of the other two angles is 90°.

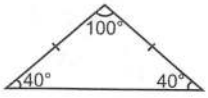
Example:



60° + 30° = 90°

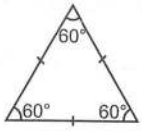
Properties of an isosceles triangle
- It has two equal sides.
- It has two equal angles.

Example:



Properties of an equilateral triangle
- It has three equal sides.
- It has three equal angles.

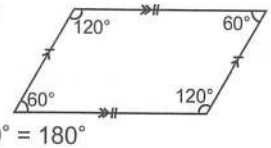
Example:



Unit 15 Quadrilaterals

Properties of a parallelogram
- Opposite sides are equal and parallel.
- Opposite angles are equal.
- The pair of angles between two parallel sides adds up to 180°.

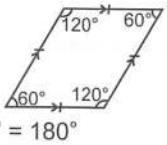
Example:



120° + 60° = 180°

Properties of a rhombus
- It has 4 equal sides.
- Opposite sides are parallel.
- Opposite angles are equal.
- The pair of angles between two parallel sides adds up to 180°.

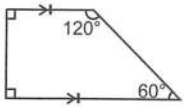
Example:



120° + 60° = 180°

Properties of a trapezium
- It has one pair of opposite parallel sides.
- The pair of angles between the parallel sides adds up to 180°.

Example:



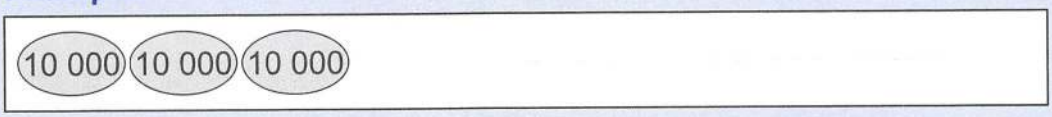
90° + 90° = 180°
120° + 60° = 180°

1 Whole Numbers

Count and write numbers within 10 million in numerals and words

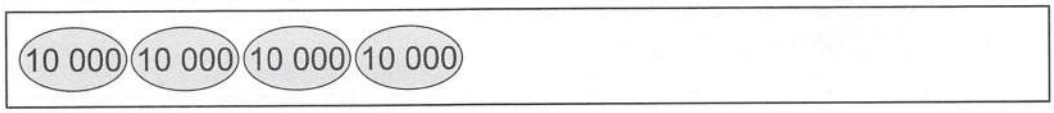
(A) Write the numbers on the lines provided. **[5 marks]**

Example:



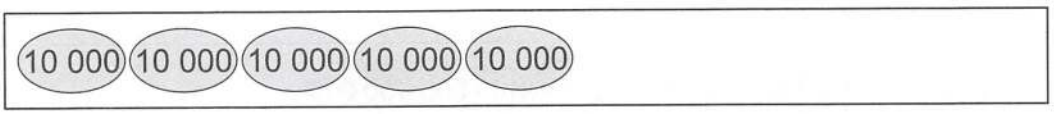
10 000, 20 000, 30 000

1.



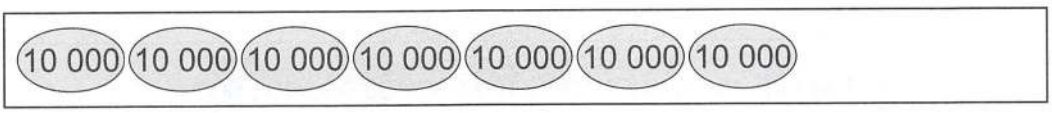
_____, _____, _____, _____

2.

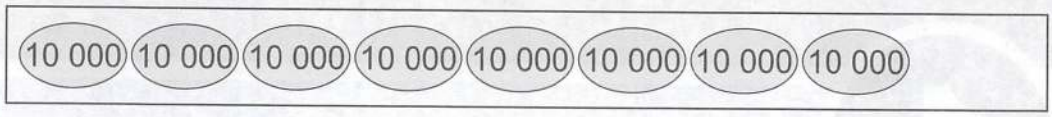


_____, _____, _____, _____, _____

3.

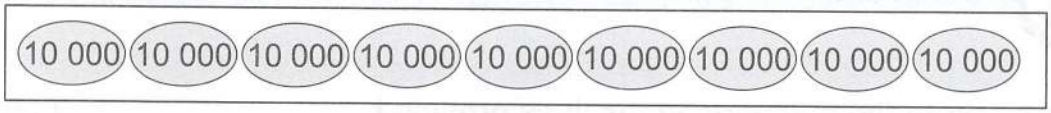


_____, _____, _____, _____, _____, _____, _____

4. 

_____, _____, _____, _____, _____, _____,

_____, _____

5. 

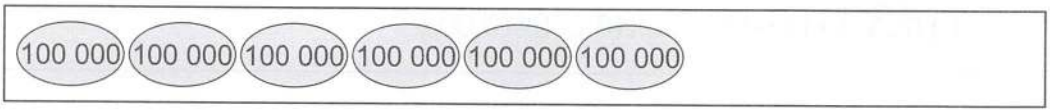
_____, _____, _____, _____, _____, _____,

_____, _____, _____

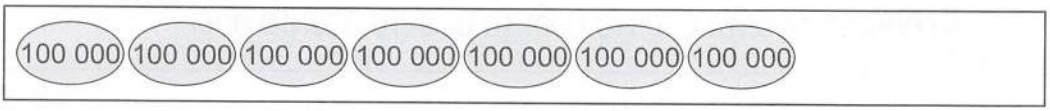
(B) Write the numbers on the lines provided. **[5 marks]**

Example:

100 000, **200 000**, **300 000**, **400 000**

1. 

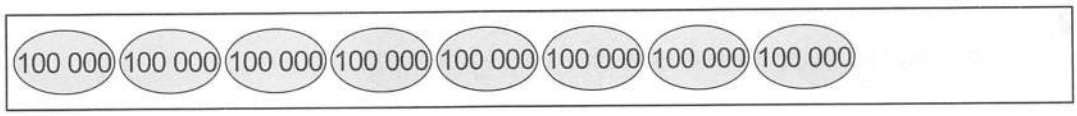
_____, _____, _____, _____, _____, _____

2. 

_____, _____, _____, _____, _____, _____

_____

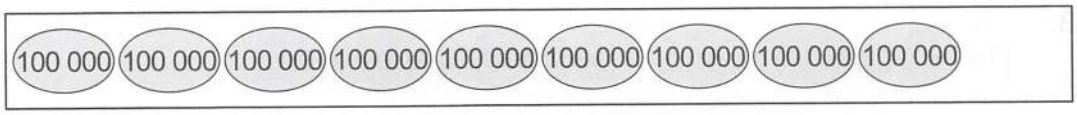
3.



_____, _____, _____, _____, _____, _____,

_____, _____

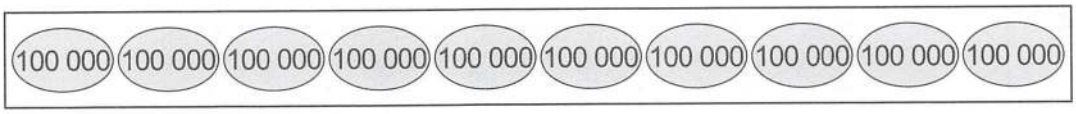
4.



_____, _____, _____, _____, _____, _____,

_____, _____, _____

5.



_____, _____, _____, _____, _____, _____,

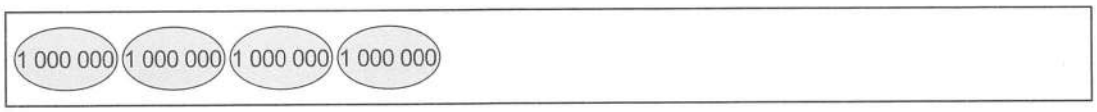
_____, _____, _____, _____

(C) Write the numbers on the lines provided. **[5 marks]**

Example:

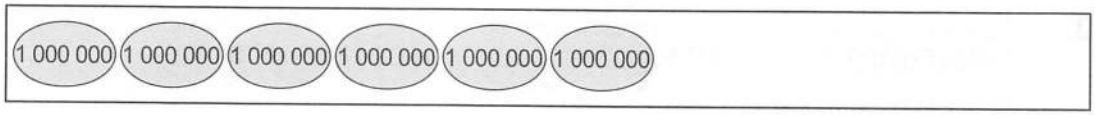
1 000 000, **2 000 000**, **3 000 000**

1.



_____, _____, _____, _____

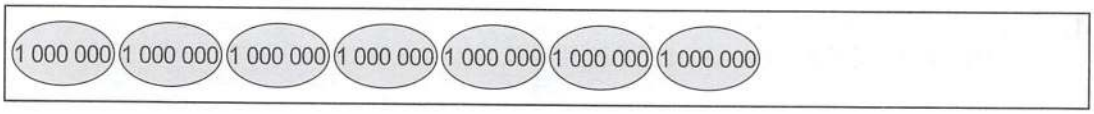
2.



_____, _____, _____, _____, _____

_____

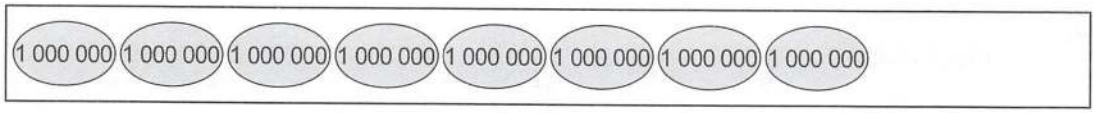
3.



_____, _____, _____, _____, _____

_____, _____

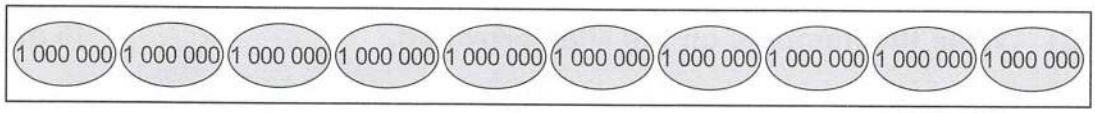
4.



_____, _____, _____, _____, _____

_____, _____, _____

5.

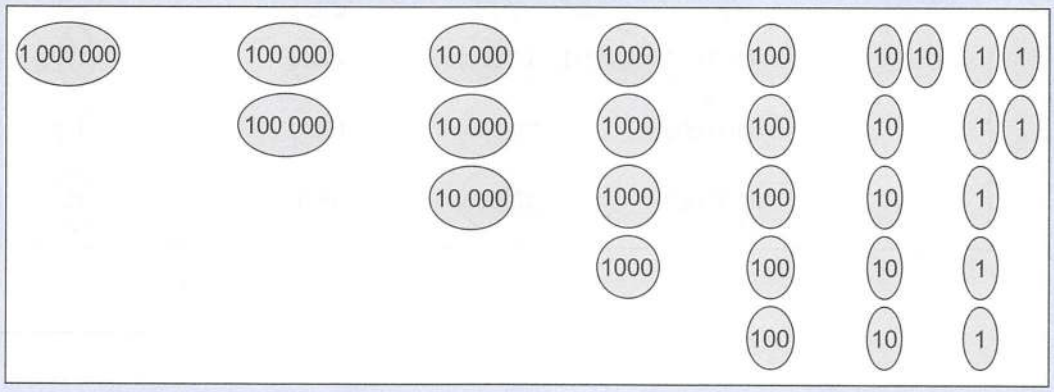


_____, _____, _____, _____, _____

_____, _____, _____, _____, _____

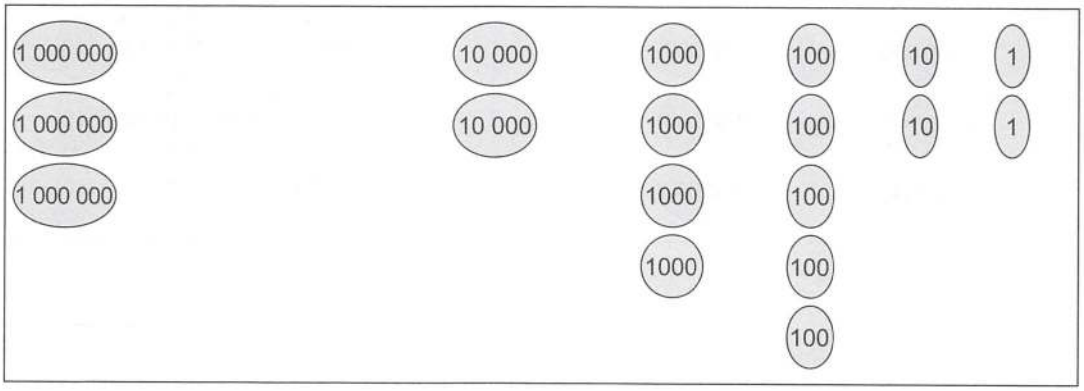
(D) Write the numbers on the lines provided. [10 marks]

Example:

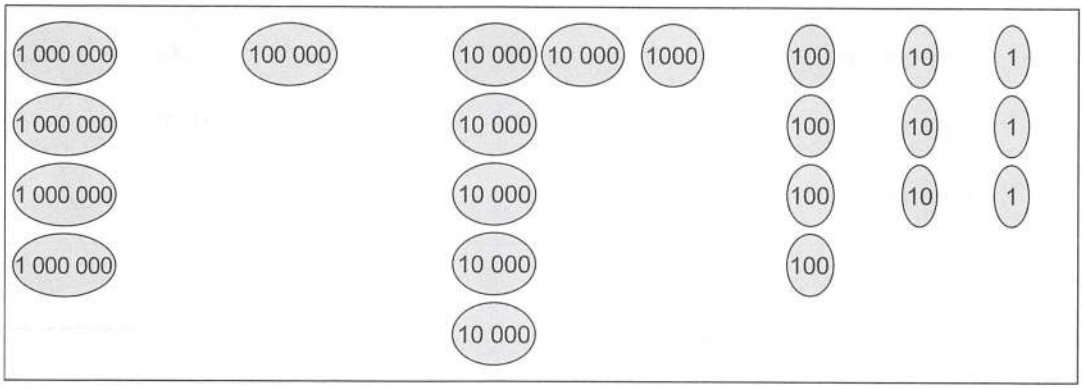


1 234 567

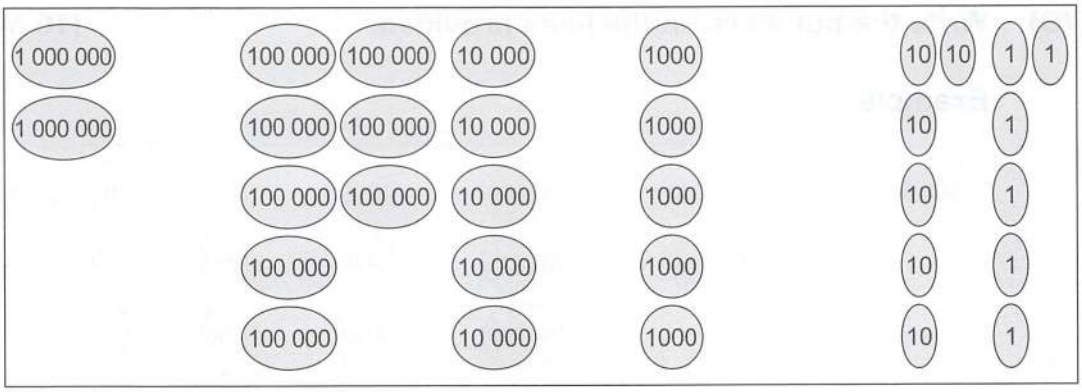
1.



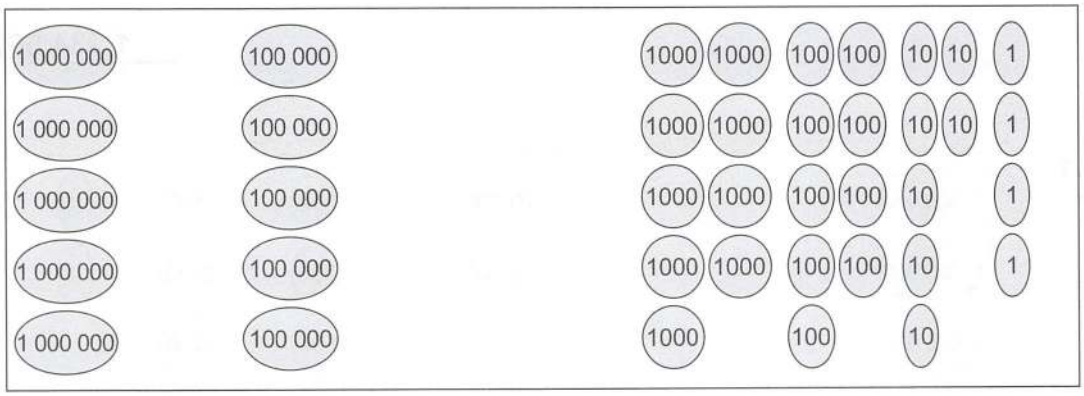
2.



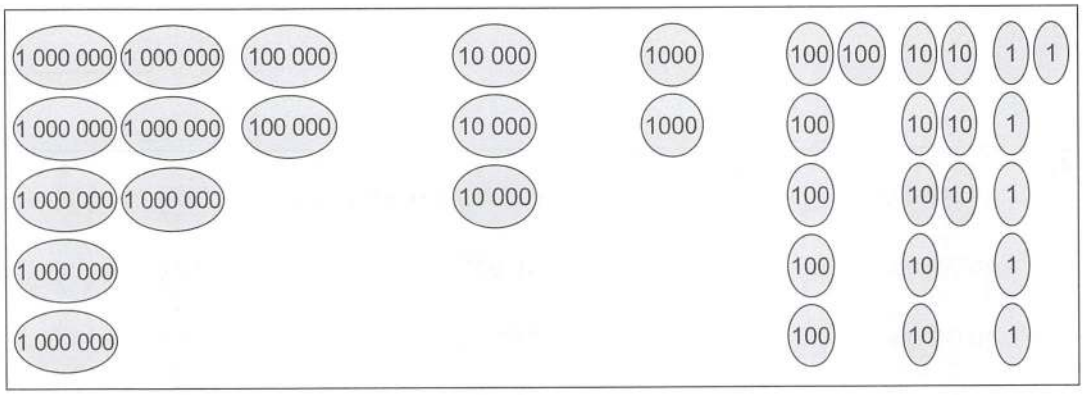
3.



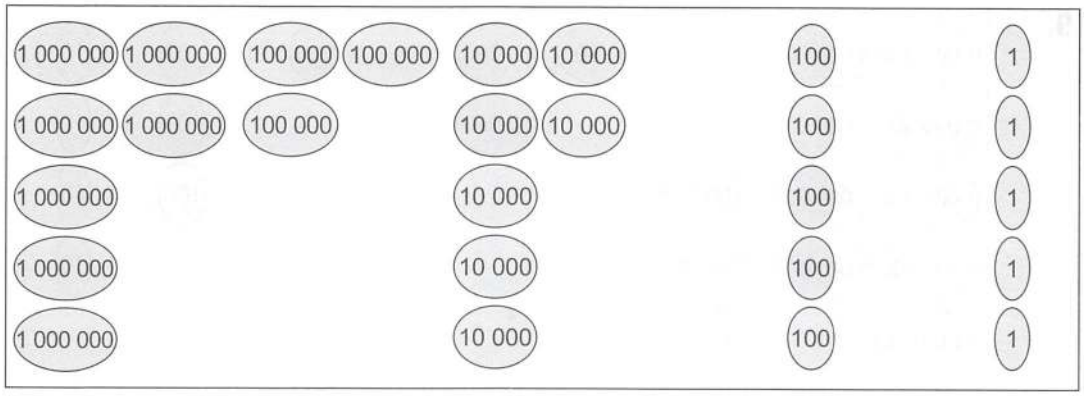
4.



5.

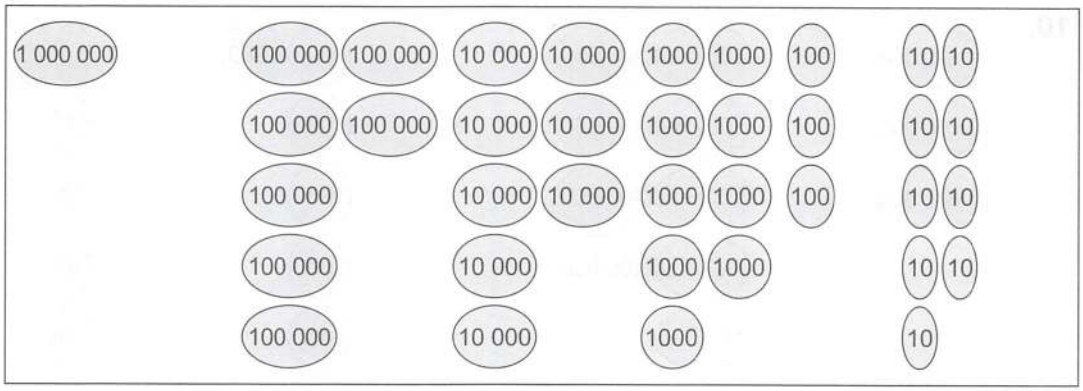


6.



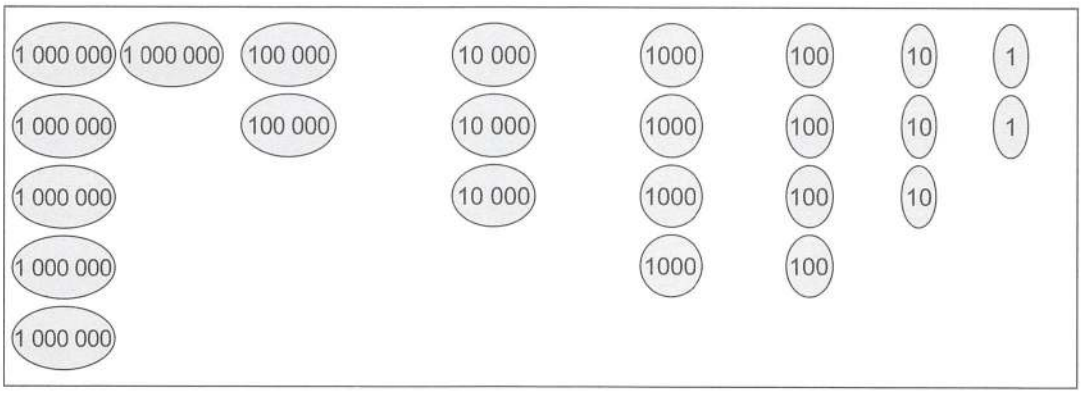
_____

7.



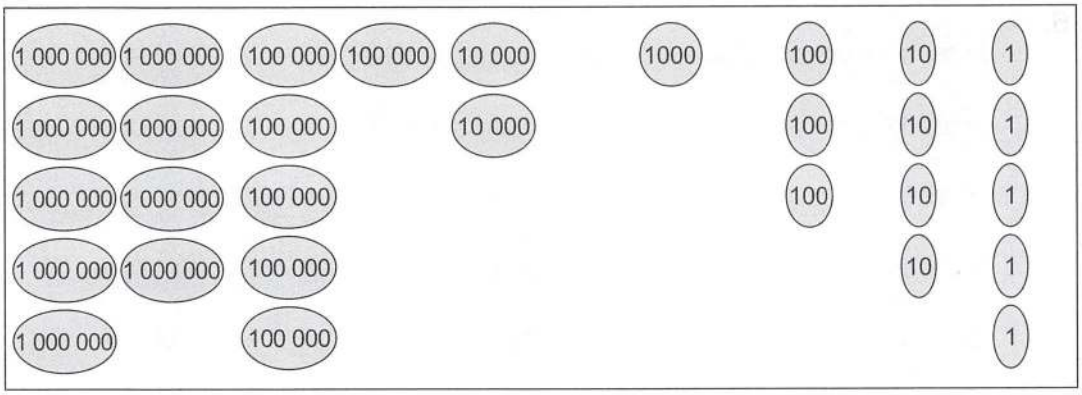
_____

8.

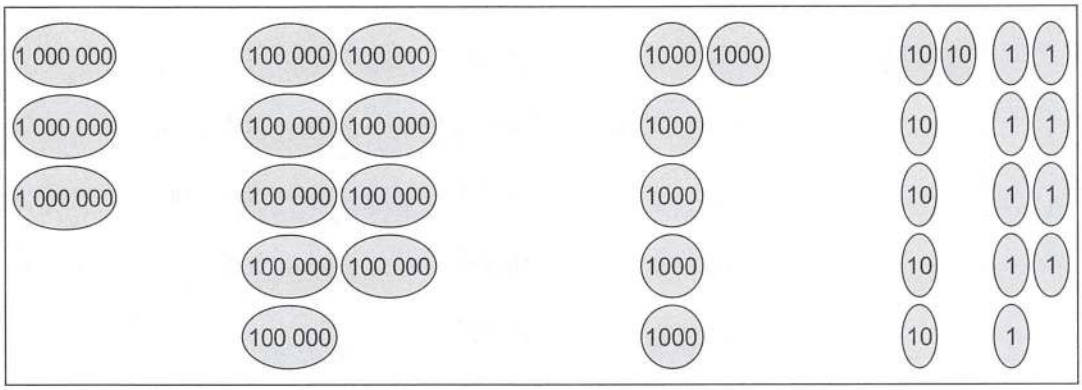


_____

9.



10.



(E) Write the following numbers in words. **[10 marks]**

1. 4 003 000 _____
2. 7 800 000 _____
3. 869 539 _____
4. 4 502 146 _____
5. 397 653 _____
6. 2 136 457 _____
7. 9 091 091 _____
8. 6 640 864 _____
9. 1 758 002 _____
10. 5 000 398 _____

(F) Write the numbers on the lines provided. **[10 marks]**

1. two million, seven hundred and six thousand _____

2. four hundred and eighty-three thousand _____

3. eight million, three hundred and fourteen _____

4. one hundred and forty-five thousand and one _____

5. six million, one hundred and one thousand and six hundred _____

6. three million, five hundred and sixty-four thousand, one hundred and seventy-eight _____

7. nine million, two thousand and nine _____

8. five million, six hundred thousand, seven hundred and three _____

9. seven million, eight hundred and ninety-four thousand and eighty-seven _____

10. four million, twenty-five thousand, two hundred and fifty _____

(G) Fill in each blank with the correct answer. **[20 marks]**

1. 72 662 = 70 000 + _____ + 600 + 62

2. 23 455 = _____ + 3000 + 400 + 50 + 5

3. 40 133 = 40 000 + _____ + 30 + 3

4. 99 099 = 90 000 + 9000 + _____ + 9

5. 56 004 = _____ + 6000 + 4

6. 551 700 = 550 000 + 1000 + _____

7. 369 078 = _____ + 60 000 + 9000 + 70 + 8

8. 606 101 = 600 000 + _____ + 100 + 1

9. 152 050 = 100 000 + _____ + 2000 + 50

10. 810 376 = 800 000 + 10 000 + _____ + 70 + 6

11. 1 000 000 = 999 000 + _____

12. 1 854 000 = 1 000 000 + _____ + 4000

13. 4 600 800 = _____ + 600 000 + 800

14. 2 350 235 = 2 000 000 + 300 000 + _____ + 235

15. 6 007 654 = 6 000 000 + 7000 + _____

16. 9 018 380 = 9 000 000 + 10 000 + _____ + 380

17. 3 133 100 = _____ + 100 000 + 30 000 + 3000 + 100

18. 5 675 025 = 5 000 000 + _____ + 70 000 + 5000 + 25

19. 7 804 708 = 7 000 000 + 800 000 + _____ + 708

20. 8 416 399 = _____ + 400 000 + 10 000 + 6000 + 399

2 Operations of Whole Numbers

Perform multiplication of tens, hundreds, thousands and their multiples

(A) Write the correct answers on the lines provided. **[9 marks]**

1. 83 × 10 = _____

2. 196 × 10 = _____

3. 6004 × 10 = _____

4. 19 × 100 = _____

5. 575 × 100 = _____

6. 1840 × 100 = _____

7. 64 × 1000 = _____

8. 183 × 1000 = _____

9. 5190 × 1000 = _____

(B) Write the correct answers on the lines provided. [18 marks]

1. 106 × _____ = 1060
2. 54 × _____ = 5400
3. 97 × _____ = 970
4. 2358 × _____ = 23 580
5. 32 × _____ = 32 000
6. 721 × _____ = 721 000
7. 489 × _____ = 48 900
8. 6710 × _____ = 671 000
9. 8494 × _____ = 8 494 000
10. _____ × 10 = 31 070
11. _____ × 100 = 58 000
12. _____ × 1000 = 41 000
13. _____ × 10 = 2550
14. _____ × 100 = 6300
15. _____ × 1000 = 7 002 000
16. _____ × 10 = 760
17. _____ × 100 = 489 900
18. _____ × 1000 = 924 000

(C) Write the correct answers on the lines provided. [27 marks]

Example:

$12 \times 30 = 12 \times \underline{\quad 3 \quad} \times 10$

$= \underline{\quad 36 \quad} \times 10$

$= \underline{\quad 360 \quad}$

1. $45 \times 60 = 45 \times \underline{\qquad} \times 10$

$= \underline{\qquad} \times 10$

$= \underline{\qquad}$

2. $313 \times 90 = 313 \times \underline{\qquad} \times 10$

$= \underline{\qquad} \times 10$

$= \underline{\qquad}$

3. $5050 \times 50 = 5050 \times \underline{\qquad} \times 10$

$= \underline{\qquad} \times 10$

$= \underline{\qquad}$

Example:

$23 \times 400 = 23 \times \underline{\quad 4 \quad} \times 100$

$= \underline{\quad 92 \quad} \times 100$

$= \underline{\quad 9200 \quad}$

4. $56 \times 700 = 56 \times \underline{\qquad} \times 100$

$= \underline{\qquad} \times 100$

$= \underline{\qquad}$

5. 824 × 300 = 824 × _____ × 100

= _____ × 100

= _____

6. 1357 × 900 = 1357 × _____ × 100

= _____ × 100

= _____

Example:

4 × 5000 = 4 × **5** × 1000

= **20** × 1000

= **20 000**

7. 6 × 7000 = 6 × _____ × 1000

= _____ × 1000

= _____

8. 17 × 8000 = 17 × _____ × 1000

= _____ × 1000

= _____

9. 987 × 2000 = 987 × _____ × 1000

= _____ × 1000

= _____

Perform division of tens, hundreds, thousands and their multiples

(A) Write the correct answers on the lines provided. **[15 marks]**

1. 50 ÷ 10 = _____
2. 410 ÷ 10 = _____
3. 7070 ÷ 10 = _____
4. 23 450 ÷ 10 = _____
5. 367 110 ÷ 10 = _____
6. 6 880 000 ÷ 10 = _____
7. 600 ÷ 100 = _____
8. 8400 ÷ 100 = _____
9. 15 900 ÷ 100 = _____
10. 704 500 ÷ 100 = _____
11. 1 026 100 ÷ 100 = _____
12. 4000 ÷ 1000 = _____
13. 60 000 ÷ 1000 = _____
14. 985 000 ÷ 1000 = _____
15. 8 102 000 ÷ 1000 = _____

(B) Write the correct answers on the lines provided. [28 marks]

1. 320 ÷ _____ = 32

2. 400 ÷ _____ = 4

3. 8000 ÷ _____ = 8

4. 1560 ÷ _____ = 156

5. 91 000 ÷ _____ = 91

6. 307 000 ÷ _____ = 3070

7. 61 100 ÷ _____ = 6110

8. 1 575 000 ÷ _____ = 1575

9. 2700 ÷ _____ = 27

10. 8 940 000 ÷ _____ = 89 400

11. 482 000 ÷ _____ = 48 200

12. 526 000 ÷ _____ = 526

13. 73 500 ÷ _____ = 735

14. 2 122 110 ÷ _____ = 212 211

15. _____ ÷ 1000 = 3

16. _____ ÷ 100 = 9

17. _____ ÷ 10 = 1010

18. _____ ÷ 1000 = 1800

19. _____ ÷ 100 = 7676

20. _____ ÷ 10 = 70

21. _____ ÷ 1000 = 992

22. _____ ÷ 100 = 686

23. _____ ÷ 10 = 420

24. _____ ÷ 1000 = 24

25. _____ ÷ 100 = 55

26. _____ ÷ 10 = 83 000

27. _____ ÷ 100 = 50 057

28. _____ ÷ 10 = 345 200

(C) Write the correct answers on the lines provided. [24 marks]

Example:

480 ÷ 40 = 480 ÷ 10 ÷ 4

= 48 ÷ 4

= 12

1. 950 ÷ 50 = 950 ÷ _____ ÷ _____

= _____ ÷ _____

= _____

2. 5760 ÷ 90 = 5760 ÷ _____ ÷ _____

= _____ ÷ _____

= _____

3. 42 420 ÷ 70 = 42 420 ÷ _____ ÷ _____

= _____ ÷ _____

= _____

4. 586 380 ÷ 60 = 586 380 ÷ _____ ÷ _____

= _____ ÷ _____

= _____

5. 3 124 480 ÷ 80 = 3 124 480 ÷ _____ ÷ _____

= _____ ÷ _____

= _____

6. 7600 ÷ 400 = 7600 ÷ _____ ÷ _____

= _____ ÷ _____

= _____

7. 90 900 ÷ 300 = 90 900 ÷ _____ ÷ _____

= _____ ÷ _____

= _____

8. 876 500 ÷ 500 = 876 500 ÷ _____ ÷ _____

= _____ ÷ _____

= _____

9. 4 113 200 ÷ 700 = 4 113 200 ÷ _____ ÷ _____

= _____ ÷ _____

= _____

10. 72 000 ÷ 8000 = 72 000 ÷ _____ ÷ _____

= _____ ÷ _____

= _____

11. 550 000 ÷ 5000 = 550 000 ÷ _____ ÷ _____

= _____ ÷ _____

= _____

12. 6 336 000 ÷ 9000 = 6 336 000 ÷ _____ ÷ _____

= _____ ÷ _____

= _____

Perform order of operations

Do these sums. Use a calculator to check your answers. **[20 marks]**

1. (35 + 15 + 20) ÷ 7 = _____

2. 18 ÷ 3 + 32 – 10 = _____

3. 36 – 84 ÷ 12 + 14 × 5 = _____

4. 78 ÷ (456 – 450) × 90 = _____

5. 8 × (17 – 9) – 28 = _____

6. 56 ÷ 8 + 13 × (88 – 28) = _____

7. 600 + (72 – 32) ÷ 5 × 80 = _____

8. 100 ÷ 20 × (5 + 9) = _____

9. 55 ÷ (13 – 8) – 7 + 21 × 2 = _____

10. (18 – 5) × 7 + (23 – 11) ÷ 3 = _____

11. $80 \times 15 \div 40 \times 12 =$ _____

12. $(144 \div 12) \times (72 \div 9) =$ _____

13. $48 \times 50 \div 10 \div 8 =$ _____

14. $145 - 34 - (23 - 12) =$ _____

15. $(145 - 34) - 23 - 12 =$ _____

16. $145 - (34 - 23) - 12 =$ _____

17. $(25 + 45) \times (28 + 32) \div (14 + 16) =$ _____

18. $(220 + 130) \div (29 + 21) \times (525 + 275) =$ _____

19. $(30 \times 20 + 120) \div (350 - 11 \times 10) =$ _____

20. $(810 \div 90 - 7) \times (6 + 250 \div 50) =$ _____

Solve word problems related to whole numbers

Do these word problems. Show your working clearly in the space provided.

1. The price of a blouse was twice the price of a skirt. Annie spent $150 on four such blouses and two such skirts. What was the cost of each blouse?

[2 marks]

2. Jeremy bought 30 books at $7 each at a book fair. If he saved $5 per book, how much would he have to pay to buy all the books at the original price?

[2 marks]

3. A baker sold 278 pies on Tuesday. He sold 39 more pies on Tuesday than on Monday. The number of pies he sold on Wednesday was twice the number of pies sold on Tuesday. How many pies did the baker sell altogether on the three days? **[2 marks]**

4. Kelly had three times as much money as Andy. After giving Andy $450, Kelly had twice as much money as he had.

(a) How much money did Andy have in the end? **[1 mark]**

(b) How much money did Kelly have at first? **[2 marks]**

5. Mrs Jackson bought 3 kg of prawns at $22 per kg, 5 kg of crabs at $18 per kg and some squids at $9 per kg. If Mrs Jackson paid $264 for the seafood, how many kilograms of squids did she buy? **[2 marks]**

6. When two dozen tins of canned food are placed in a pail, the mass is 4560 g. When 18 tins of such canned food are placed in the same pail, the mass is 3480 g. Find the mass of the pail. **[3 marks]**

7. Zoe bought a leather sofa and was allowed to pay for it in instalments. After paying a deposit of $399, she could pay the rest in 24 monthly instalments. If Zoe paid $275 every month, how much was the leather sofa? **[1 mark]**

8. Sally packed 783 strawberries equally into 9 packs. After giving 4 such packs to her neighbours, she decided to repack 5 strawberries into each pack. How many packs of strawberries did she have in the end? **[3 marks]**

9. Mr Johnson imported some cartons of instant noodles. There were 28 packs of instant noodles in each carton. He then sold 10 packs of instant noodles for $5. If he had received $280 from the sale of instant noodles, how many cartons of instant noodles were sold? **[3 marks]**

10. A shopkeeper bought 7 boxes of storybooks. Each box had 25 storybooks. He then bought another 9 boxes of pencils. There were 100 pencils in each box. If the shopkeeper paid $19 for each storybook and $2 for each pencil, how much did he pay in all? **[3 marks]**

11. There are four times as many yellow marbles as green marbles in a box. If there are 48 more yellow marbles than green marbles, how many marbles are there altogether in the box? **[2 marks]**

12. Grace arranges some plums in boxes of 8 and some kiwis in boxes of 4. After selling each box of plums at $2 and each box of kiwis at $5, she has $2516. If Grace sells 7 times as many boxes of kiwis as the number of boxes of plums, how many pieces of fruit does she sell in all? **[3 marks]**

13. David bought 5 similar bracelets at a price of $2079 each. He paid for the bracelets in 15 instalments. How much did he pay for each instalment?

[2 marks]

14. A baker bought 680 000 g of flour and packed the flour into 200 similar bags. He used some flour and had 100 such bags left. He decided to repack the remaining flour into bags of 5000 g. How many bags of flour did he have in the end?

[3 marks]

Do Review 1 to practise on Whole Numbers and Operations of Whole Numbers.
Go to **My SAPeducation App** or www.sapgrp.com

3 Fractions and Mixed Numbers

Make a connection between fractions and division

(A) Find the value of the following. Express your answer as a fraction in its simplest form or as a mixed number. **[10 marks]**

Examples:

$2 \div 8 = \frac{1}{4}$

$2 \div 8 = \frac{2}{8} = \frac{1}{4}$

$10 \div 4 = 2\frac{1}{2}$

$10 \div 4 = \frac{10}{4} = \frac{5}{2} = 2\frac{1}{2}$

1. $4 \div 14 =$

2. $5 \div 75 =$

3. $9 \div 39 =$

4. $12 \div 64 =$

5. $13 \div 117 =$

6. $12 \div 8 =$

7. $29 \div 5 =$

8. $36 \div 7 =$

9. $42 \div 4 =$

10. $82 \div 6 =$

(B) Express each fraction or mixed number as a division sentence.

[10 marks]

Examples:

$\frac{4}{5} = 4 \div 5$

$1\frac{2}{3} = \frac{5}{3} = 5 \div 3$

1. $\frac{3}{10} =$

2. $\frac{6}{7} =$

3. $\frac{8}{9} =$

4. $\frac{11}{12} =$

5. $\frac{15}{101} =$

6. $2\frac{4}{5} =$

7. $4\frac{5}{6} =$

8. $7\frac{7}{8} =$

9. $10\frac{1}{10} =$

10. $11\frac{11}{13} =$

Convert fractions to decimals

Convert the following fractions to decimals. Round off your answer to 2 decimal places. **[10 marks]**

Examples:

$\frac{2}{5} = 0.4$

$\frac{2}{3} \approx 0.67$

$\frac{2}{5} = \frac{4}{10} = 0.4$

$\frac{2}{3} = 2 \div 3 \approx 0.67$

$$3\overline{)2.0} = 0.666$$
$$18$$
$$20$$
$$18$$
$$20$$
$$18$$
$$2$$

1. $\frac{5}{20} =$

2. $\frac{6}{25} =$

3. $\frac{4}{7} \approx$

4. $6\frac{2}{9} \approx$

5. $7\frac{3}{13} \approx$

6. $\frac{3}{8} \approx$

7. $\frac{9}{11} \approx$

8. $13\frac{1}{3} \approx$

9. $5\frac{5}{14} \approx$

10. $2\frac{11}{12} \approx$

Add and subtract mixed numbers

(A) Add the mixed numbers. Express your answer in its simplest form. **[10 marks]**

Example:

$1\frac{2}{3} + 2\frac{3}{4} = \mathbf{4\frac{5}{12}}$

$$1\frac{2}{3} + 2\frac{3}{4} = 1\frac{8}{12} + 2\frac{9}{12}$$
$$= 3\frac{17}{12}$$
$$= 3 + \frac{12}{12} + \frac{5}{12}$$
$$= 4\frac{5}{12}$$

1. $2\frac{7}{8} + 1\frac{1}{3} =$

2. $4\frac{4}{9} + 1\frac{3}{4} =$

3. $10\frac{2}{5} + 3\frac{2}{7} =$

4. $2\frac{1}{2} + 3\frac{2}{3} =$

5. $4\frac{1}{4} + 6\frac{1}{6} =$

6. $3\frac{1}{6} + 5\frac{5}{9} =$

7. $3\frac{2}{3} + 4\frac{4}{5} =$

8. $9\frac{6}{7} + 2\frac{1}{4} =$

9. $7\frac{7}{8} + 8\frac{4}{5} =$

10. $6\frac{3}{5} + 6\frac{7}{12} =$

(B) Subtract the mixed numbers. Express your answer in its simplest form. **[10 marks]**

Example:

$2\frac{3}{4} - 1\frac{2}{3} = \mathbf{1\frac{1}{12}}$

$2\frac{3}{4} - 1\frac{2}{3} = 2\frac{9}{12} - 1\frac{8}{12}$

$= 1\frac{1}{12}$

1. $5\frac{3}{5} - 1\frac{3}{10} =$

2. $4\frac{9}{10} - 2\frac{2}{3} =$

3. $12\frac{5}{8} - 4\frac{3}{4} =$

4. $3\frac{1}{2} - 1\frac{1}{6} =$

5. $8\frac{3}{4} - 5\frac{5}{6} =$

6. $6\frac{3}{11} - 3\frac{1}{2} =$

7. $2\frac{4}{5} - 1\frac{3}{4} =$

8. $4\frac{1}{7} - 3\frac{1}{3} =$

9. $10\frac{2}{5} - 6\frac{3}{7} =$

10. $9\frac{4}{5} - 2\frac{8}{9} =$

NOTES

4 Multiplying Whole Numbers, Fractions and Mixed Numbers

Find the product of fractions and whole numbers

Multiply the fractions by the whole numbers. **[10 marks]**

Example:

$\frac{1}{4} \times 12 = 3$ $\frac{1}{4} \times 12 = \frac{1 \times 12}{4} = \frac{12}{4} = 3$ or $\frac{1}{\cancel{4}_{1}} \times \overset{3}{\cancel{12}} = 3$

1. $\frac{1}{5} \times 60 =$ _____

2. $\frac{2}{3} \times 24 =$ _____

3. $\frac{4}{7} \times 42 =$ _____

4. $\frac{5}{9} \times 54 =$ _____

5. $\frac{10}{11} \times 33 =$ _____

6. $\frac{3}{2} \times 28 =$ _____

7. $\frac{5}{4} \times 16 =$ _____

8. $\frac{9}{5} \times 65 =$ _____

9. $\frac{13}{10} \times 70 =$ _____

10. $\frac{12}{11} \times 88 =$ _____

Find the product of proper fractions

Multiply these proper fractions. Express your answer in its simplest form.

[10 marks]

Example:

$\frac{1}{2} \times \frac{2}{3} = \mathbf{\frac{1}{3}}$ $\frac{1}{2} \times \frac{2}{3} = \frac{1 \times 2}{2 \times 3} = \frac{2}{6} = \frac{1}{3}$ or $\frac{1}{\cancel{2}_{1}} \times \frac{\cancel{2}^{1}}{3} = \frac{1}{3}$

1. $\frac{4}{9} \times \frac{3}{8} =$ _____

2. $\frac{5}{12} \times \frac{4}{7} =$ _____

3. $\frac{2}{5} \times \frac{6}{10} =$ _____

4. $\frac{11}{12} \times \frac{3}{9} =$ _____

5. $\frac{8}{9} \times \frac{3}{4} =$ _____

6. $\frac{2}{5} \times \frac{2}{3} =$ _____

7. $\frac{5}{6} \times \frac{3}{10} =$ _____

8. $\frac{7}{10} \times \frac{4}{21} =$ _____

9. $\frac{5}{7} \times \frac{14}{25} =$ _____

10. $\frac{8}{15} \times \frac{9}{20} =$ _____

Find the product of proper and improper fractions

Multiply the proper fractions by the improper fractions. **[10 marks]**

Example:

$\frac{1}{3} \times \frac{4}{3} = \mathbf{\frac{4}{9}}$

$\frac{1}{3} \times \frac{4}{3} = \frac{1 \times 4}{3 \times 3}$

$= \frac{4}{9}$

1. $\frac{4}{7} \times \frac{9}{5} =$ _____

2. $\frac{18}{4} \times \frac{2}{9} =$ _____

3. $\frac{7}{3} \times \frac{1}{8} =$ _____

4. $\frac{5}{6} \times \frac{12}{5} =$ _____

5. $\frac{16}{9} \times \frac{3}{8} =$ _____

6. $\frac{10}{11} \times \frac{21}{6} =$ _____

7. $\frac{3}{8} \times \frac{15}{2} =$ _____

8. $\frac{23}{5} \times \frac{10}{12} =$ _____

9. $\frac{25}{9} \times \frac{18}{35} =$ _____

10. $\frac{30}{63} \times \frac{27}{10} =$ _____

Find the product of improper fractions

Multiply these improper fractions. **[10 marks]**

Example:

$\frac{3}{2} \times \frac{4}{3} = 2$

$\frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{2}}} \times \frac{\overset{2}{\cancel{4}}}{\underset{1}{\cancel{3}}} = 2$

1. $\frac{13}{10} \times \frac{20}{8} =$ _____

2. $\frac{10}{3} \times \frac{21}{5} =$ _____

3. $\frac{9}{2} \times \frac{13}{6} =$ _____

4. $\frac{10}{7} \times \frac{21}{4} =$ _____

5. $\frac{24}{15} \times \frac{30}{18} =$ _____

6. $\frac{49}{9} \times \frac{30}{7} =$ _____

7. $\frac{15}{11} \times \frac{35}{12} =$ _____

8. $\frac{33}{8} \times \frac{41}{7} =$ _____

9. $\frac{17}{6} \times \frac{19}{9} =$ _____

10. $\frac{41}{14} \times \frac{21}{12} =$ _____

Find the product of mixed numbers and whole numbers

Multiply the mixed numbers by the whole numbers. **[10 marks]**

Example:

$1\frac{2}{3} \times 10 = \mathbf{16\frac{2}{3}}$

$$1\frac{2}{3} \times 10 = \frac{5}{3} \times 10$$
$$= \frac{5 \times 10}{3}$$
$$= \frac{50}{3}$$
$$= 16\frac{2}{3}$$

1. $2\frac{3}{5} \times 40 =$ _____

2. $6\frac{1}{8} \times 18 =$ _____

3. $16 \times 3\frac{1}{3} =$ _____

4. $20 \times 4\frac{3}{4} =$ _____

5. $5\frac{5}{9} \times 35 =$ _____

6. $8\frac{2}{7} \times 56 =$ _____

7. $99 \times 5\frac{7}{11} =$ _____

8. $74 \times 4\frac{5}{6} =$ _____

9. $8\frac{9}{10} \times 64 =$ _____

10. $85 \times 5\frac{8}{15} =$ _____

NOTES

5 Word Problems on Fractions

Solve word problems related to fractions

Do these word problems. Show your working clearly in the space provided.

1. Peter cycles from his house to the library. After cycling for $3\frac{2}{5}$ km, he still has to cycle for another $2\frac{1}{2}$ km in order to reach the library. How far is his house from the library? **[1 mark]**

2. Queenie has $3\frac{1}{2}$ *l* of fruit juice. She drinks $1\frac{1}{8}$ *l* of it in a day. How much fruit juice is left? **[2 marks]**

3. Kelly bought a rope of length $3\frac{4}{9}$ m. Bruce bought a rope of length $1\frac{3}{5}$ m shorter than Kelly's. What was the total length of rope they bought? **[2 marks]**

4. Clara took $1\frac{1}{4}$ hours to finish her Mathematics homework. She took $1\frac{5}{6}$ hours more to finish her English homework than her Mathematics homework. How long did Clara take to finish all her homework? **[2 marks]**

5. The total mass of a watermelon, a papaya and a honeydew is $6\frac{1}{2}$ kg. The watermelon has a mass of $3\frac{3}{4}$ kg. The papaya has a mass of $1\frac{7}{8}$ kg lighter than the watermelon. What is the mass of the honeydew? **[3 marks]**

6. Terry bought 5 pizzas. After his sisters had eaten some, there were $3\frac{3}{4}$ pizzas left. He ate $\frac{7}{8}$ fewer pizza than his sisters. How many pizzas were eaten in all? **[3 marks]**

7. Winnie prepared 9 litres of syrup. She poured them equally into 4 similar containers and gave one container of syrup to her neighbour. How many litres of syrup did her neighbour receive? **[1 mark]**

8. A group of workers are given 30 days to renovate an apartment. The process includes hacking, cementing, tiling and painting. If the workers wish to devote their time equally among the activities, how much time should they spend on each activity? **[1 mark]**

9. A shopkeeper buys two sacks of rice that weigh $2\frac{5}{6}$ kg and $4\frac{1}{6}$ kg. If he packs the rice equally into 5 bags, how much does each bag weigh? **[2 marks]**

10. A team of 5 runners takes part in a 21-km relay race. If each team member runs an equal distance of the race, what is the distance each runner covers? **[1 mark]**

11. A bag of hazelnuts has a mass of 15 kg. The mass of a bag of cashew nuts is $\frac{2}{5}$ that of the bag of hazelnuts.

(a) What is the total mass of the bags of hazelnuts and cashew nuts?

[2 marks]

(b) The nuts are then mixed together and packed equally into 8 bags. What is the mass of each bag of mixed nuts? **[1 mark]**

12. Mr Adam earns $4815 every month. He saves $\frac{2}{9}$ of it and spends $\frac{1}{2}$ of the remaining amount of money on food. How much does he spend on food?

[3 marks]

13. After Eugene spent $\frac{3}{8}$ of his money and Tammy spent $\frac{3}{8}$ of her money, Eugene had \$40 more than Tammy. How much more money did Eugene have than Tammy at first?

[3 marks]

14. Cindy lost $\frac{1}{3}$ of her marbles in a game. She gave $\frac{2}{5}$ of the remaining marbles to her sister and put the rest of the marbles equally into 4 pouches. If each pouch contained 72 marbles, how many marbles did she have at first?

[3 marks]

15. Wallace and Andy had a total of 560 trading cards. After Wallace lost $\frac{1}{9}$ of his trading cards to Andy, they had an equal number of trading cards. How many more trading cards did Wallace have than Andy at first? **[2 marks]**

16. The breadth of field A is $\frac{7}{12}$ its length of 108 m. What will the perimeter of field B be if it has $\frac{5}{6}$ the perimeter of field A? **[3 marks]**

17. There are 1400 students in a school. The number of girls is $\frac{3}{4}$ the number of boys. How many students are in other levels if $\frac{1}{6}$ of the girls and $\frac{1}{5}$ of the boys are in Primary One? **[5 marks]**

18. Christine gave $\frac{3}{7}$ of the orange juice to her brother. She drank $\frac{1}{4}$ of the remaining orange juice. What fraction of the orange juice had she left? **[1 mark]**

19. Elle had \$840. She spent $\frac{5}{12}$ of the money on some clothes. $\frac{7}{10}$ of the money spent on the clothes was used to purchase 4 dresses of the same price. How much did each dress cost? **[3 marks]**

20. Lara had some money in her savings account. She withdrew $\frac{3}{8}$ of it and spent $\frac{2}{9}$ of it on some books. She gave $\frac{4}{7}$ of the remaining money to her mother and banked the rest of the money. If Lara had banked \$756, how much money did she have in her savings account at first? **[3 marks]**

21. Joslin bought 32 packs of red beans. The mass of each pack of red beans was $45\frac{3}{4}$ g.

(a) What was the total mass of all 32 packs of red beans? **[1 mark]**

(b) If Joslin gave $\frac{1}{3}$ of the red beans to her neighbour, what was the mass of red beans left? **[2 marks]**

22. $\frac{3}{7}$ of the chocolates in a shop were plain chocolates. The number of chocolates with strawberry filling was twice the number of chocolates with coffee filling. The number of chocolates with coffee filling was $\frac{1}{3}$ of those with nuts. If there were 108 chocolates with coffee filling, how many plain chocolates were there? **[3 marks]**

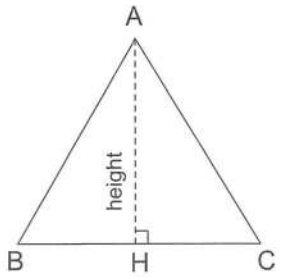
Do Review 2 to practise on Fractions and Mixed Numbers, Multiplying Whole Numbers, Fractions and Mixed Numbers and Word Problems on Fractions.
Try the challenging Non-Routine Questions 1 for further application.
Go to **My SAPeducation App** or www.sapgrp.com

6 Area of Triangles

Identify the base and height of a triangle

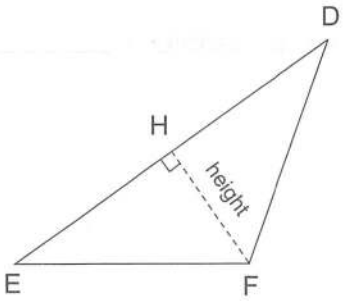
(A) Identify the base for the given height in each triangle. **[8 marks]**

1.



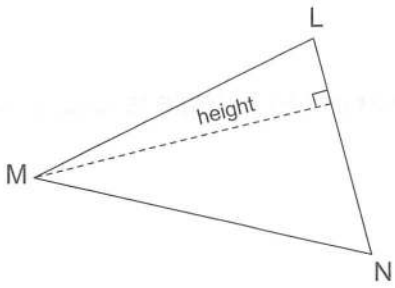
The base of the triangle is _____.

2.



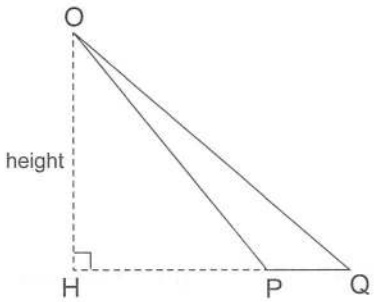
The base of the triangle is _____.

3.



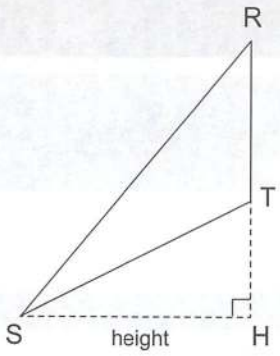
The base of the triangle is _____.

4.



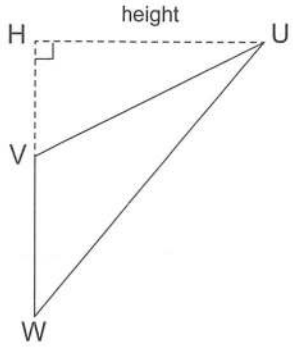
The base of the triangle is _____.

5.



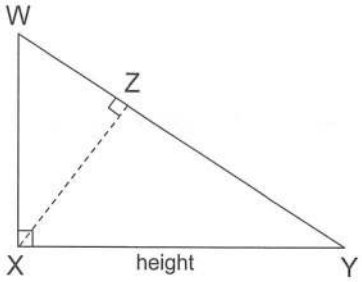
The base of the triangle is _____.

6.



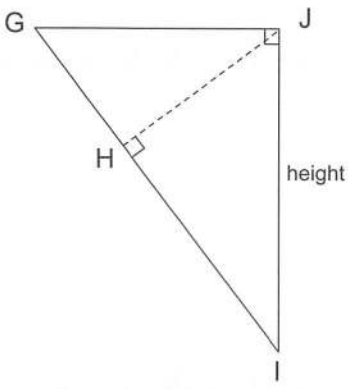
The base of the triangle is _____.

7.



The base of the triangle is _____.

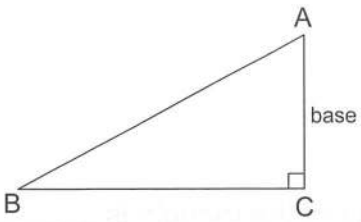
8.



The base of the triangle is _____.

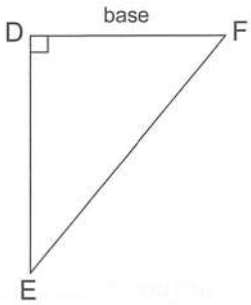
(B) Identify the height for the given base in each triangle. **[8 marks]**

1.



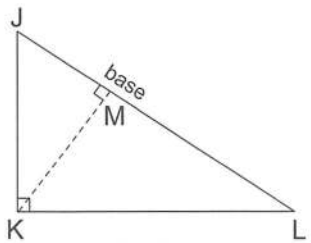
The height of the triangle is _____.

2.



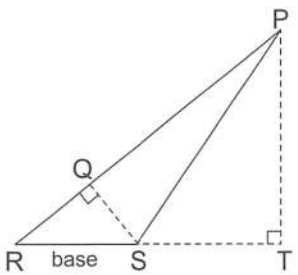
The height of the triangle is _____.

3.



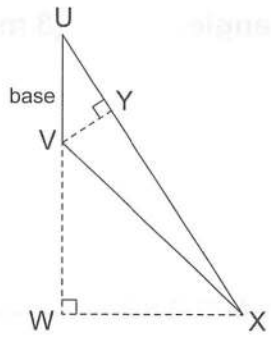
The height of the triangle is _____.

4.



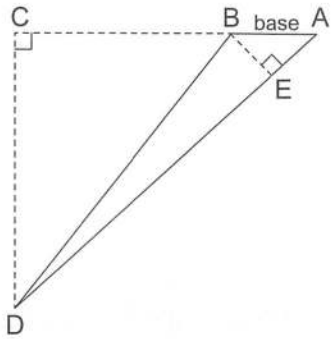
The height of the triangle is _____.

5.



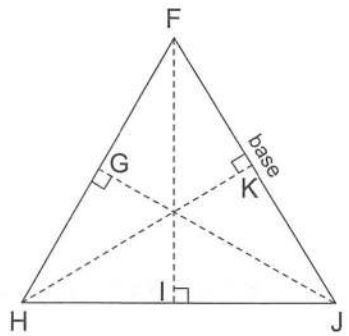
The height of the triangle is _____.

6.



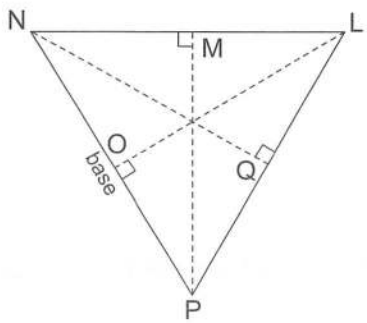
The height of the triangle is _____.

7.



The height of the triangle is _____.

8.

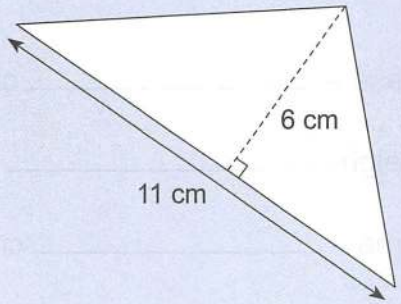


The height of the triangle is _____.

Apply the formula to calculate the area of triangles

Find the area of each triangle. **[10 marks]**

Example:



Base = 11 cm

Height = 6 cm

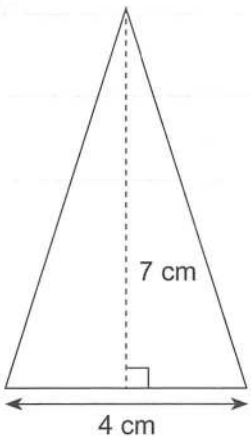
Area = 33 cm^2

Area = $\frac{1}{2}$ × Base × Height

= $\frac{1}{2}$ × 11 × 6

= 33 cm^2

1.

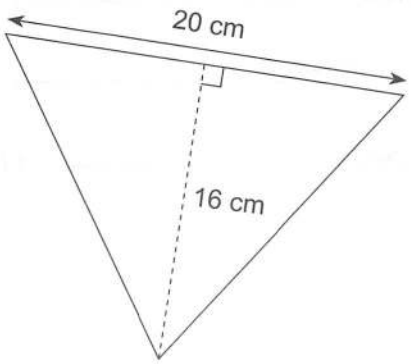


Base = _____ cm

Height = _____ cm

Area = _____ cm^2

2.

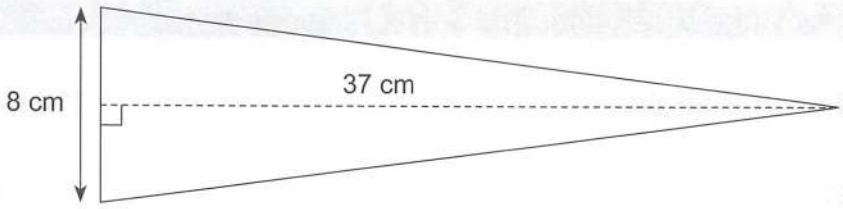


Base = _____ cm

Height = _____ cm

Area = _____ cm^2

3.

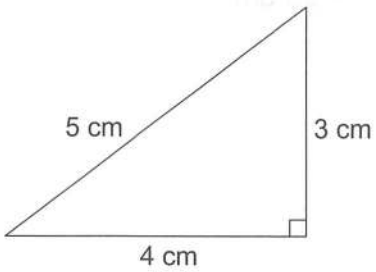


Base = _____ cm

Height = _____ cm

Area = _____ cm^2

4.

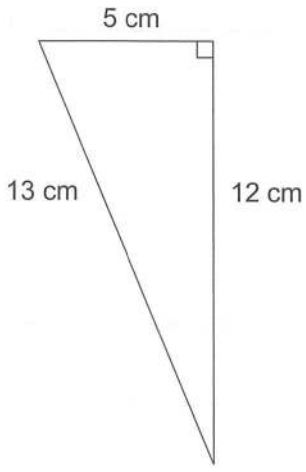


Base = _____ cm

Height = _____ cm

Area = _____ cm^2

5.



Base = _____ cm

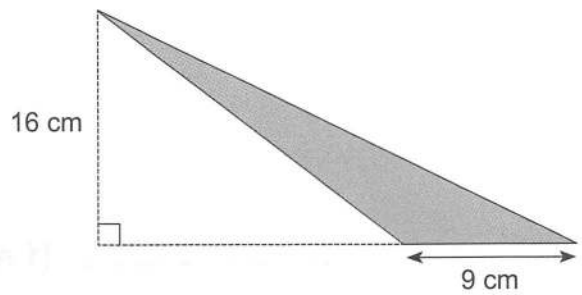
Height = _____ cm

Area = _____ cm^2

Find the area of shaded triangles and composite figures

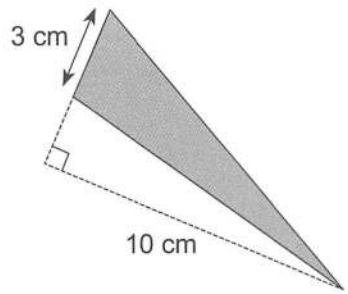
For each figure, find the area of the shaded triangle.

1.



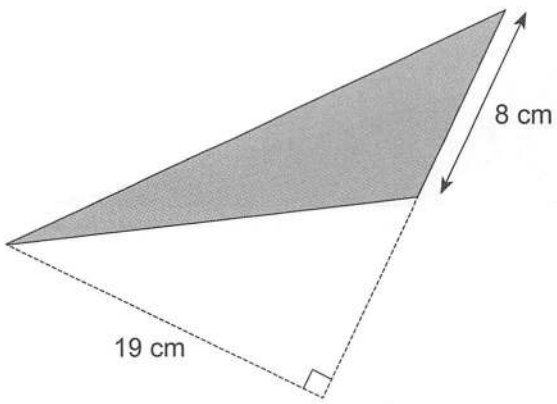
_____ **[1 mark]**

2.



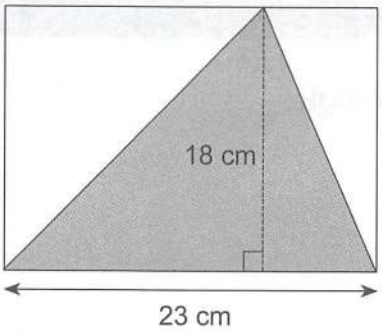
_____ **[1 mark]**

3.



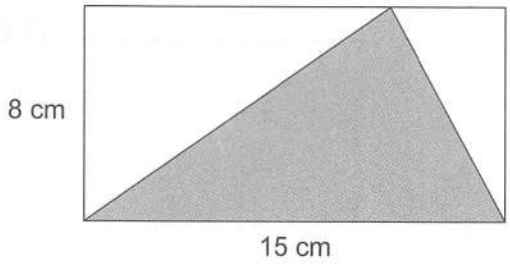
_____ **[1 mark]**

4.



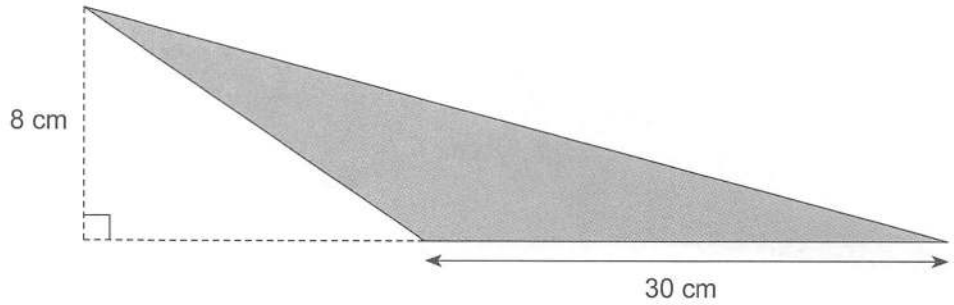
_____ [1 mark]

5.



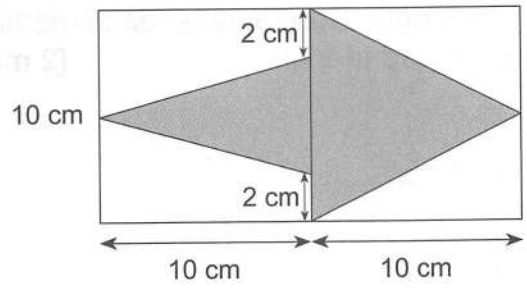
_____ [1 mark]

6.



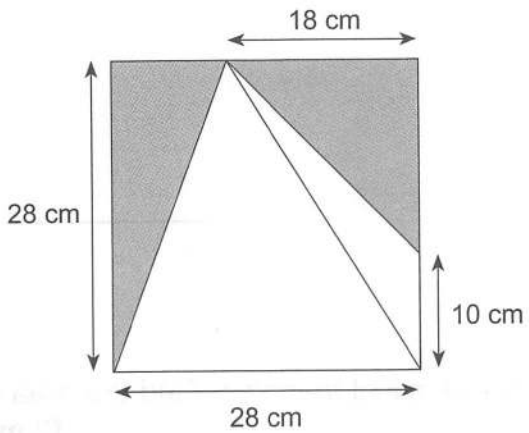
_____ [1 mark]

7.



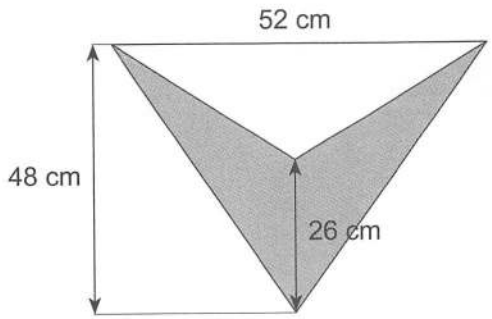
_____ **[3 marks]**

8.



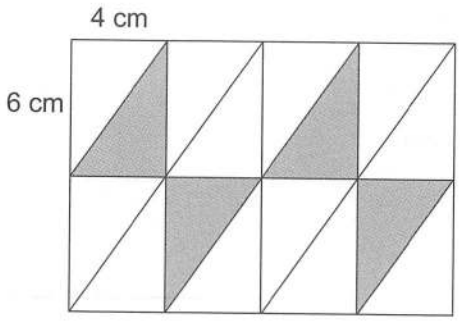
_____ **[3 marks]**

9.

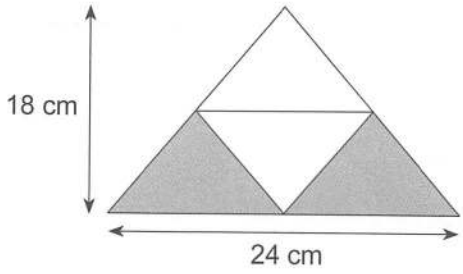


_____ **[3 marks]**

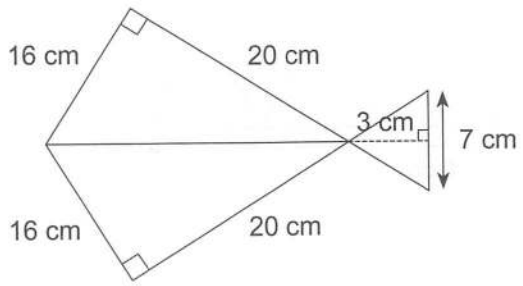
10. The figure below is made up of eight identical rectangles, each measuring 4 cm by 6 cm. Find the area of the shaded triangles. **[2 marks]**



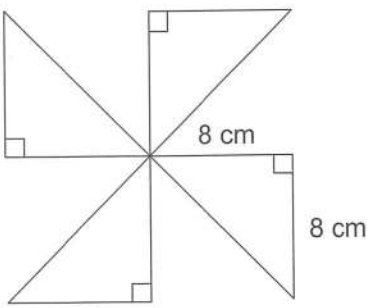
11. The figure below is made up of four identical triangles. Find the area of the shaded triangles. **[2 marks]**



12. The figure below is made up of three triangles. Find its area. **[3 marks]**

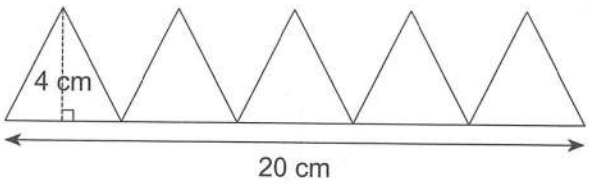


13. The figure below is made up of four identical triangles. Find its area. **[2 marks]**



14. The figure below is made up of five identical triangles. Find its area.

[3 marks]

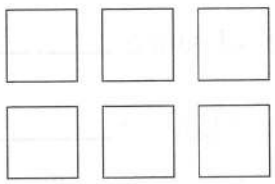


7 Ratio

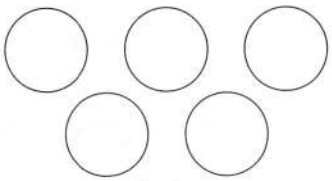
Find ratio and equivalent ratio of two or three given quantities

(A) Fill in each blank with ratio in its simplest form. **[27 marks]**

1.



squares

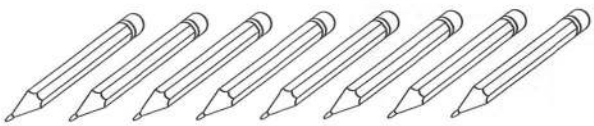


circles

The ratio of the number of squares to the number of circles is _____.

The ratio of the number of circles to the number of squares is _____.

2.



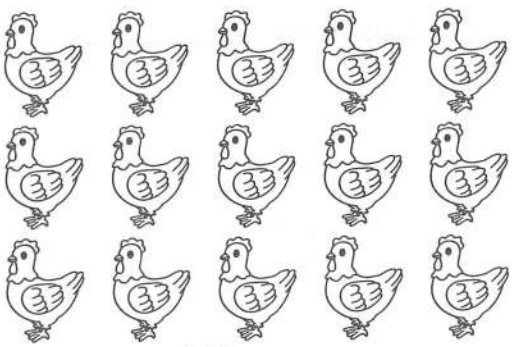
pencils

erasers

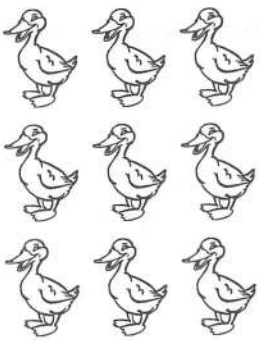
The ratio of the number of pencils to the number of erasers is _____.

The ratio of the number of erasers to the number of pencils is _____.

3.



chickens



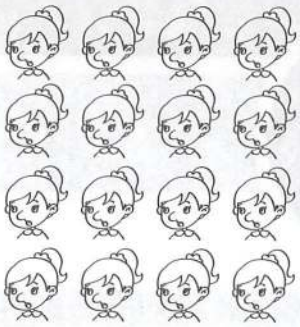
ducks

The ratio of the number of chickens to the number of ducks is _____.

The ratio of the number of ducks to the number of chickens is _____.

4.

boys

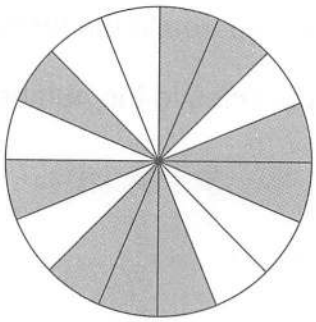


girls

The ratio of the number of boys to the number of girls is _____.

The ratio of the number of girls to the number of boys is _____.

5.



The ratio of shaded sectors to unshaded sectors is _____.

The ratio of unshaded sectors to shaded sectors is _____.

6.

Stick A

30 cm

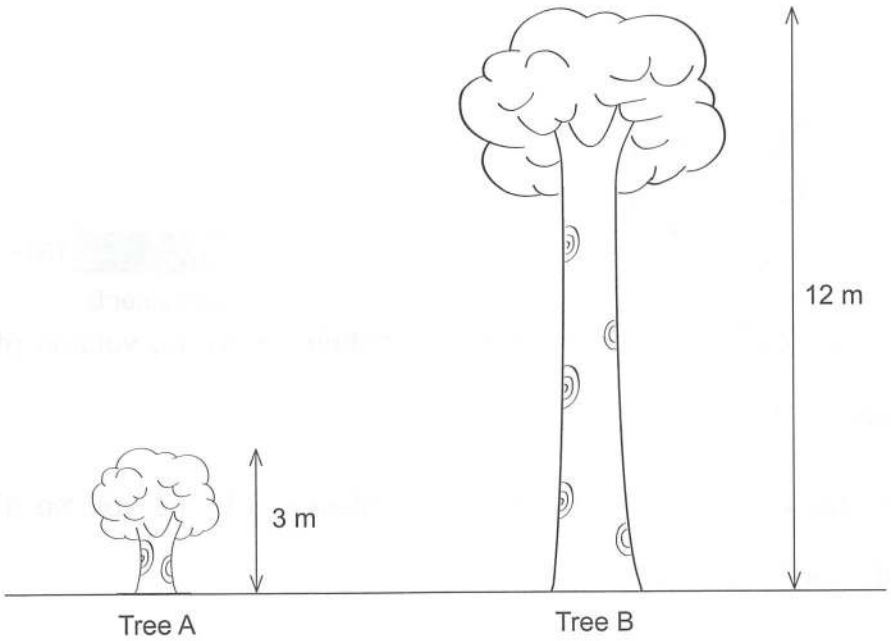
Stick B

45 cm

The ratio of the length of stick A to the length of stick B is _____.

The ratio of the length of stick B to the length of stick A is _____.

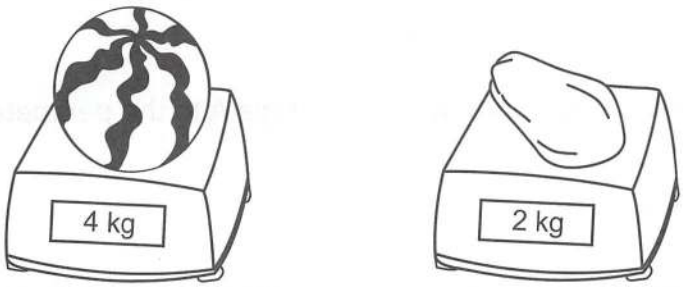
7.



The ratio of the height of tree A to the height of tree B is _____.

The ratio of the height of tree B to the height of tree A is _____.

8.



The ratio of the mass of the watermelon to the mass of the papaya is

_____.

The ratio of the mass of the papaya to the mass of the watermelon is

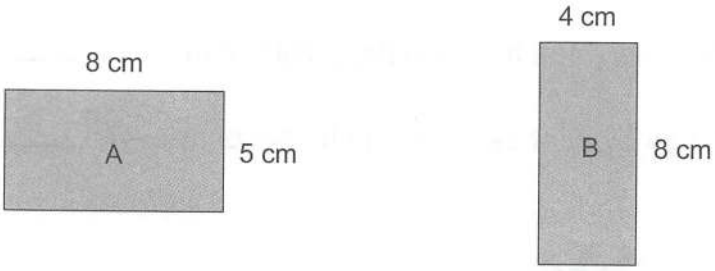
_____.

9.

The ratio of the volume of water in container A to the volume of water in container B is _____.

The ratio of the volume of water in container B to the volume of water in container A is _____.

10.



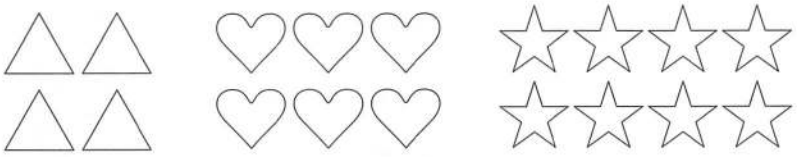
(a) The ratio of the perimeter of rectangle A to the perimeter of rectangle B is _____.

The ratio of the perimeter of rectangle B to the perimeter of rectangle A is _____.

(b) The ratio of the area of rectangle A to the area of rectangle B is _____.

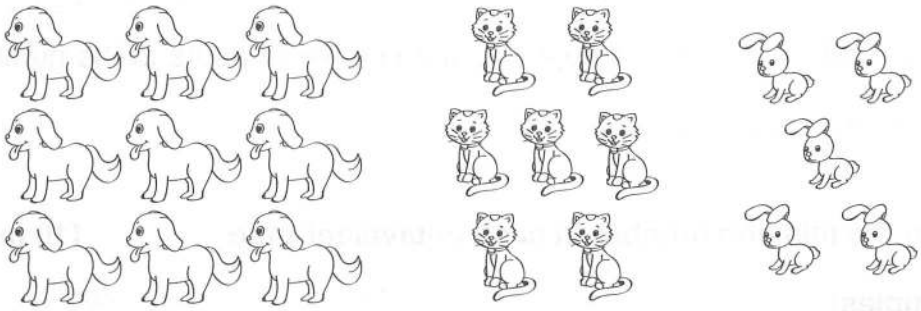
The ratio of the area of rectangle B to the area of rectangle A is _____.

11.



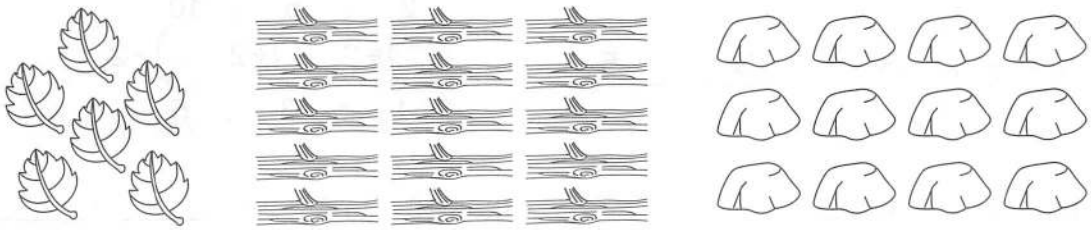
The ratio of the number of hearts to the number of triangles to the number of stars is _____.

12.



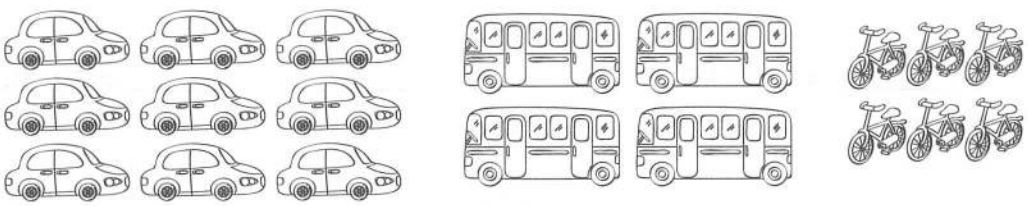
The ratio of the number of rabbits to the number of dogs to the number of cats is _____.

13.



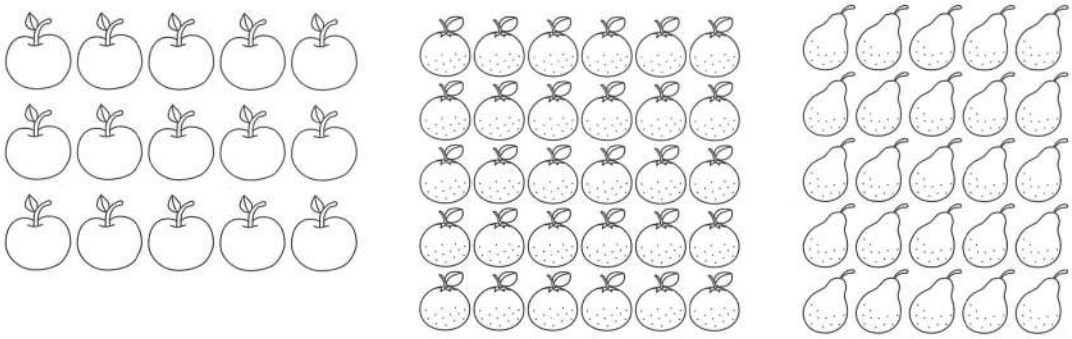
The ratio of the number of rocks to the number of twigs to the number of leaves is _____.

14.



The ratio of the number of buses to the number of bicycles to the number of cars is _____.

15.

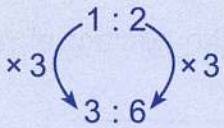


The ratio of the number of apples to the number of pears to the number of oranges is _____.

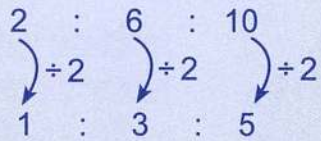
(B) Fill in the missing number in each equivalent ratio. **[10 marks]**

Examples:

1 : 2 = 3 : **6**



2 : 6 : 10 = 1 : **3** : **5**



1. 8 : 5 = 40 : _____

2. 6 : 7 = 18 : _____

3. 9 : _____ = 108 : 96

4. 54 : _____ = 9 : 6

5. _____ : 8 = 77 : 88

6. 3 : 7 : 4 = 27 : _____ : _____

7. 2 : 9 : 5 = _____ : 45 : _____

8. _____ : 6 : _____ = 72 : 48 : 56

9. _____ : 24 : _____ = 8 : 6 : 3

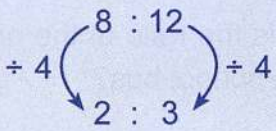
10. _____ : _____ : 3 = 60 : 96 : 36

Reduce a ratio to its simplest form

Express each ratio in its simplest form. **[10 marks]**

Example:

8 : 12 = **2 : 3**



1. 21 : 27 = _____

2. 18 : 63 = _____

3. 64 : 56 = _____

4. 25 : 120 = _____

5. 84 : 60 = _____

6. 36 : 54 : 108 = _____

7. 45 : 95 : 70 = _____

8. 100 : 75 : 225 = _____

9. 90 : 50 : 60 = _____

10. 91 : 78 : 65 = _____

Solve word problems related to ratio

(A) Write your answers on the lines provided.

1. There are 26 boys on a school bus carrying 42 students.

(a) What is the ratio of the number of boys to the total number of students on the school bus?

_____ **[1 mark]**

(b) What is the ratio of the number of girls to the number of boys on the school bus?

_____ **[2 marks]**

2. There are 46 storybooks and half as many comic books on a shelf. What is the ratio of the number of comic books to the total number of books on the shelf?

_____ **[3 marks]**

3. Town A is 15 km away from the market. Town B is 24 km away from the market. What is the ratio of the distance from Town A to the market to the distance from Town A to Town B?

_____ **[2 marks]**

4. The table below shows the postage for mail to England.

Types of mail	Postage
Postcards	$0.80
Letters	$1.45
Parcels up to 200 g	$5
Parcels up to 500 g	$9

(a) What is the ratio of the postage for a postcard to the postage for a letter?

_____ **[1 mark]**

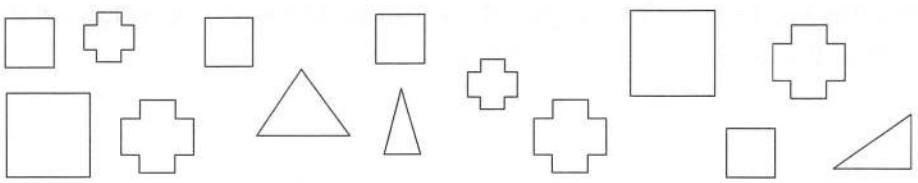
(b) What is the ratio of the postage for a 200-g parcel to the postage for a 300-g parcel?

_____ **[1 mark]**

(c) What is the ratio of the postage for 3 postcards to the postage for a 450-g parcel?

_____ **[2 marks]**

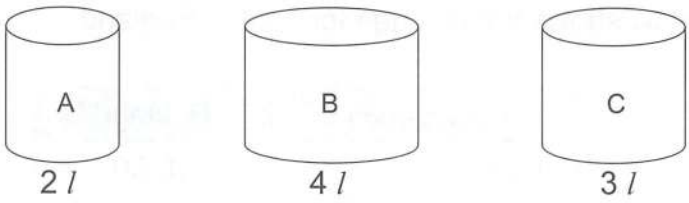
5.



What is the ratio of the number of triangles to the number of squares to the number of crosses?

_____ **[1 mark]**

6.



What is the ratio of the capacity of container A to the capacity of container C to the total capacity of the three containers?

_____ **[2 marks]**

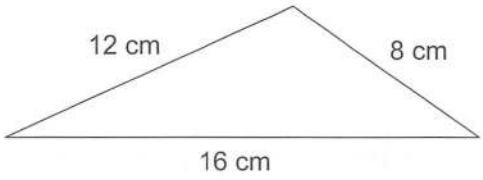
7. The admission charge to a concert is shown below.

Adult	$57
Child	$24
Senior citizen	$42

What is the ratio of the price of an admission ticket for a senior citizen to the price of an admission ticket for an adult to the price of an admission ticket for a child?

_____ **[1 mark]**

8. What is the ratio of the length of the longest side to the length of the shortest side of the triangle shown below?



_____ **[1 mark]**

(B) Do these word problems. Show your working clearly in the space provided.

1. The ratio of the number of adults to the number of children in a library is 5 : 6. If there are 102 children in the library, how many people are there in the library? **[2 marks]**

2. The ratio of the number of pairs of boots to the number of pairs of sandals in a shop is 8 : 3. If there are 245 more pairs of boots, how many pairs of boots are in the shop? **[3 marks]**

3. The ratio of a worker's wage on a weekday to his wage on a weekend is 3 : 4. If he is paid $42 on a weekday, how much does he earn for working on Saturday and Sunday? **[2 marks]**

4. There are 22 roses, 12 daisies and 16 carnations in a bouquet.

(a) What is the ratio of the number of roses to the total number of flowers in the bouquet? **[2 marks]**

(b) How many carnations must be added to the bouquet so that the ratio of the number of daisies to the number of carnations becomes 1 : 3? **[2 marks]**

5. Jasmine bought 3500 g of flour. She used $\frac{3}{7}$ of it to bake some tarts and 700 g of it to bake a cake. Find the ratio of the amount of flour used for baking the cake to the amount of flour used for baking the tarts to the remaining amount of flour. **[3 marks]**

6. Peter, Kathy and Russell share a sum of money in the ratio 2 : 5 : 4.

(a) If Peter receives $72, how much is the sum of money? **[2 marks]**

(b) How much must Kathy give to Peter so that both will get an equal share? **[2 marks]**

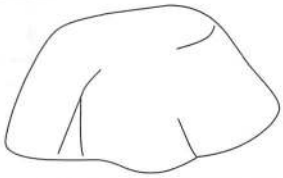
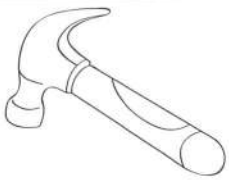
7. The ratio of the number of stamps that Trina has to the number of stamps that Patty has is 7 : 6. The ratio of the number of stamps that Patty has to the number of stamps that Alice has is 3 : 5. What is the ratio of the number of stamps that Alice has to the total number of stamps that the three girls have? **[2 marks]**

8. The ratio of the price of an adult train ticket to the price of a child train ticket is 8 : 5. Mr David pays $64 for two adult train tickets. How much is the cost of a child train ticket? **[2 marks]**

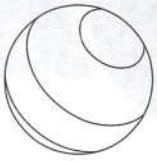
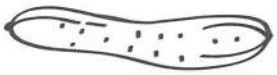
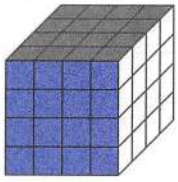
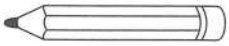
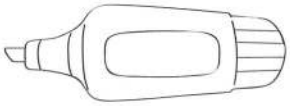
8 Volume of Cubes and Cuboids

Compare the volumes of solids

1. Which of the following objects has a greater volume? Put a tick (✓) in the correct box. **[5 marks]**

(a)		
(b)		
(c)		
(d)		
(e)		

2. Which of the following objects has a smaller volume? Put a tick (✓) in the correct box. **[5 marks]**

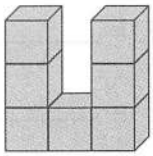
(a)		
(b)		
(c)		
(d)		
(e)		

Calculate the unit cubes in a solid

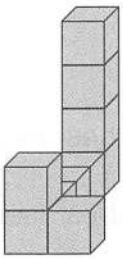
Write down the correct number of unit cubes used to build the solids shown below. Compare the volumes and fill in each blank with the correct answer.

[16 marks]

1.



Solid A



Solid B

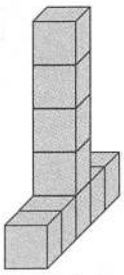
Number of unit cubes used to build solid A = _____

Number of unit cubes used to build solid B = _____

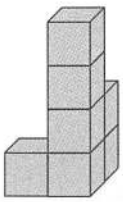
Solid _____ has a greater volume.

Solid _____ has a smaller volume.

2.



Solid C



Solid D

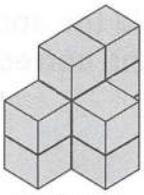
Number of unit cubes used to build solid C = _____

Number of unit cubes used to build solid D = _____

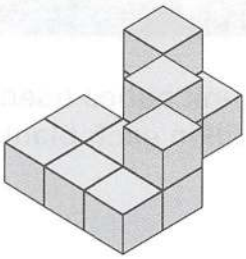
Solid _____ has a smaller volume.

Solid _____ has a greater volume.

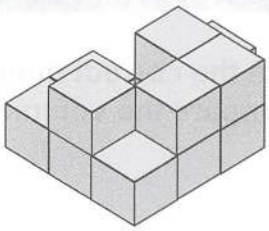
3.



Solid E



Solid F



Solid G

Number of unit cubes used to build solid E = _____

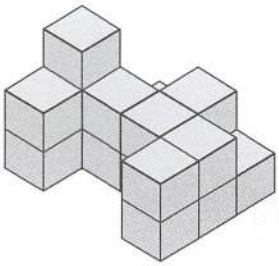
Number of unit cubes used to build solid F = _____

Number of unit cubes used to build solid G = _____

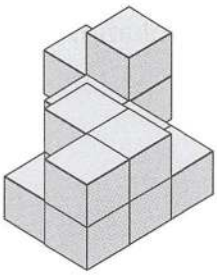
Arrange the solids in order, from the greatest to the smallest volumes.

_____, _____, _____

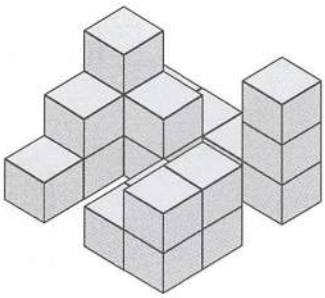
4.



Solid H



Solid J



Solid K

Number of unit cubes used to build solid H = _____

Number of unit cubes used to build solid J = _____

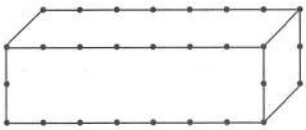
Number of unit cubes used to build solid K = _____

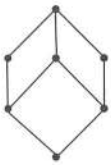
Arrange the solids in order, from the smallest to the greatest volumes.

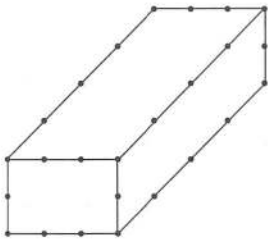
_____, _____, _____

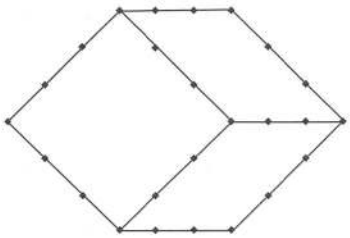
Draw a cube or cuboid on dot paper

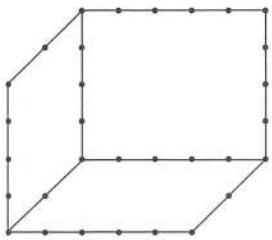
(A) Draw the following figures on the dot paper. **[5 marks]**

1. 

2. 

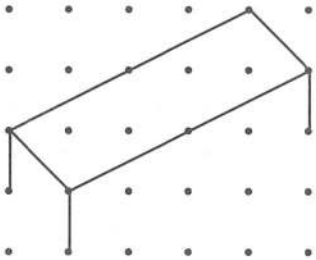
3. 

4. 

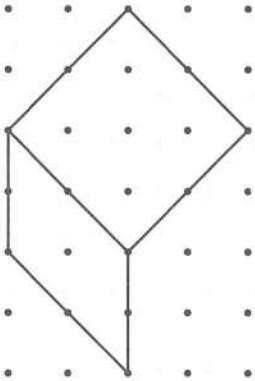
5. 

(B) Complete the following drawings of cubes and cuboids. [5 marks]

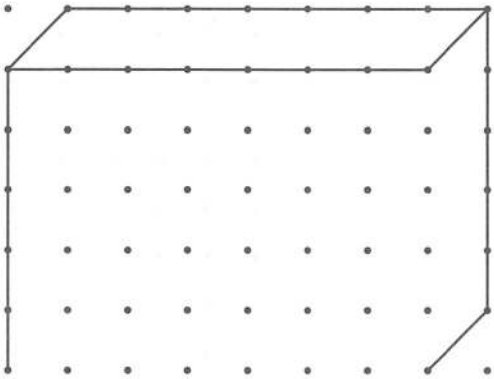
1.



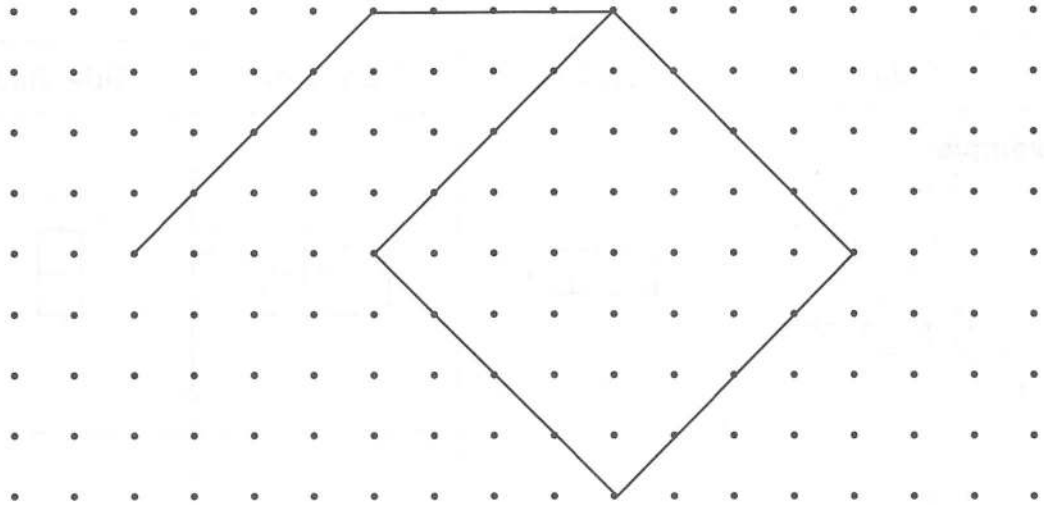
2.



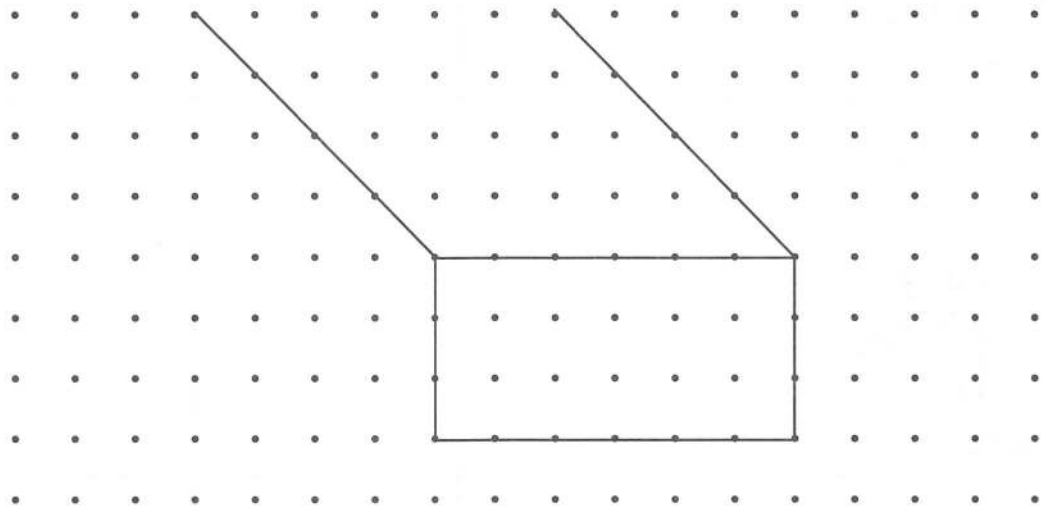
3.



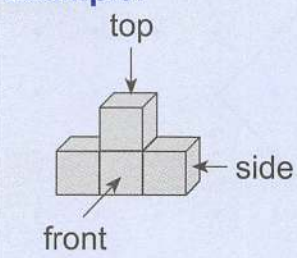
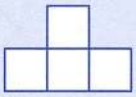
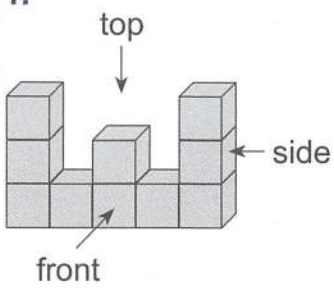
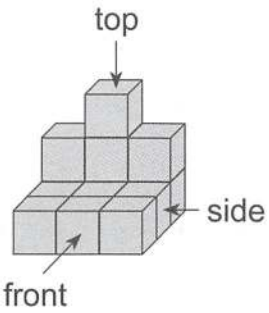
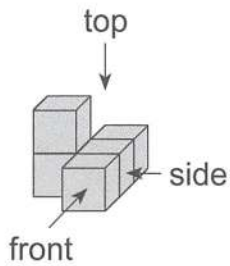
4.

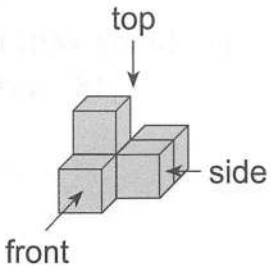
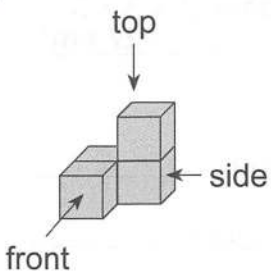


5.



(C) Draw the different views of each solid [15 marks]

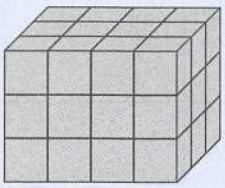
Solid	Top View	Font View	Side View
Example: 			
1. 			
2. 			
3. 			

4. 			
5. 			

Find the volume of a solid using formula

(A) The solids below are made of 1-cm cubes. Fill in each blank with the correct answer. **[16 marks]**

Example:



Length = 3 cm

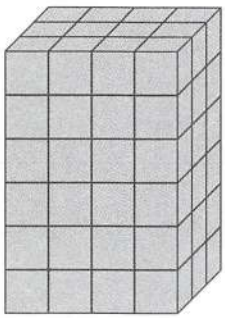
Breadth = 3 cm

Height = 3 cm

Volume = Length × Breadth × Height = 3 × 3 × 3

= 27 cm^3

1.



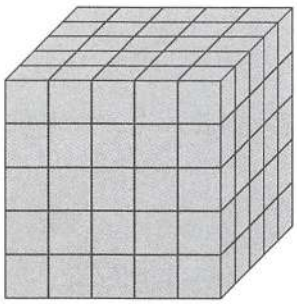
Length = _____

Breadth = _____

Height = _____

Volume = _____

2.



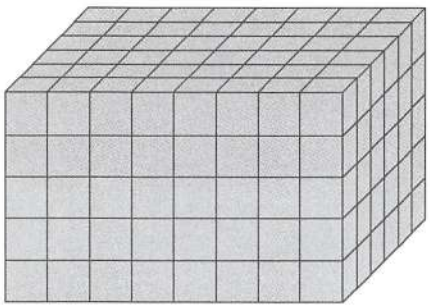
Length = _____

Breadth = _____

Height = _____

Volume = _____

3.



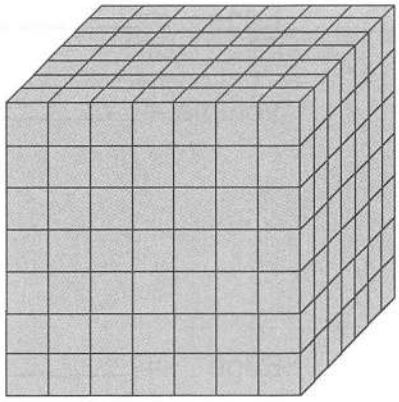
Length = _____

Breadth = _____

Height = _____

Volume = _____

4.



Length = _____

Breadth = _____

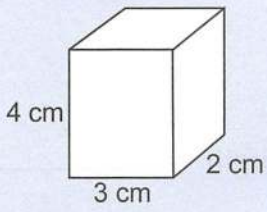
Height = _____

Volume = _____

(B) Find length, breadth, height and volume of each cube or cuboid.

[12 marks]

Example:



Length = 3 cm

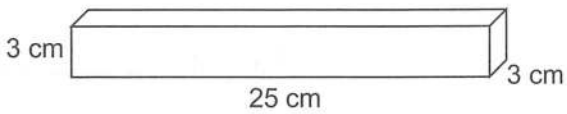
Breadth = 2 cm

Height = 4 cm

Volume = Length × Breadth × Height = 3 × 2 × 4

= 24 cm^3

1.



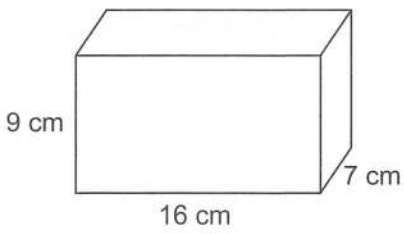
Length = _____

Breadth = _____

Height = _____

Volume = _____

2.



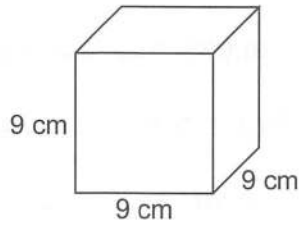
Length = _____

Breadth = _____

Height = _____

Volume = _____

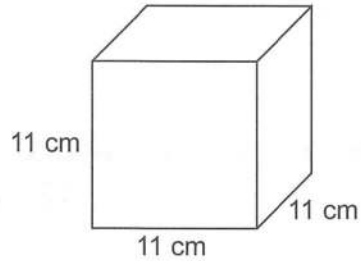
3.



Edge = _____

Volume = _____

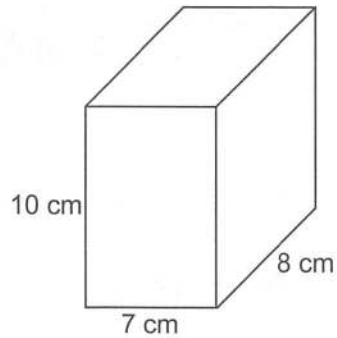
4.



Edge = _____

Volume = _____

5.



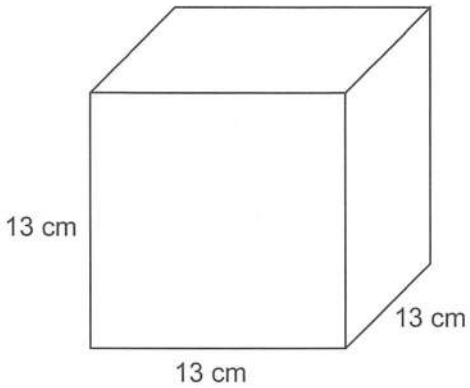
Length = _____

Breadth = _____

Height = _____

Volume = _____

6.



Edge = _____

Volume = _____

(C) Find the volume of these cubes and cuboids. [8 marks]

1.

Length	Breadth	Height
10 cm	8 cm	12 cm

Volume = _____

2.

Length	Breadth	Height
4 cm	5 cm	18 cm

Volume = _____

3.

Edge
15 cm

Volume = _____

4.

Edge
18 cm

Volume = _____

5.

Length	Breadth	Height
3 cm	3 cm	9 cm

Volume = _____

6.

Edge
22 cm

Volume = _____

7.

Length	Breadth	Height
14	13	11

Volume = _____

8.

Edge
26 cm

Volume = _____

Convert volume between cm^3, *l* and m*l*

(A) Express the following in cubic centimetres. **[10 marks]**

1. 315 m*l* = _____
2. 1 *l* 200 m*l* = _____
3. 19 *l* 3 m*l* = _____
4. 59 m*l* = _____
5. 43 *l* 7 m*l* = _____
6. 20 *l* 88 m*l* = _____
7. 5 *l* 5 m*l* = _____
8. 10 *l* 101 m*l* = _____
9. 9 *l* 99 m*l* = _____
10. 23 *l* 456 m*l* = _____

(B) Express the following in litres and millilitres. **[10 marks]**

1. 755 cm^3 = _____
2. 3004 cm^3 = _____
3. 5060 cm^3 = _____
4. 75 070 cm^3 = _____
5. 14 005 cm^3 = _____
6. 48 276 cm^3 = _____
7. 87 cm^3 = _____
8. 2200 cm^3 = _____
9. 19 800 cm^3 = _____
10. 83 308 cm^3 = _____

Solve word problems related to volume of cube and cuboid and volume of liquid

Do these word problems. Show your working clearly in the space provided.

1. A rectangular tank measures 13 cm by 25 cm by 12 cm. Find its capacity. **[1 mark]**

2. The edge of a cube is 13 cm. Find its volume. **[1 mark]**

3. A cuboid is 38 cm long, 17 cm wide and 9.5 cm high. Find its volume. **[1 mark]**

4. A rectangular tank of base area 600 cm^2 and height of 19 cm is half-filled with water. Find how much water is needed to fill the tank completely. Express your answer in litres. (1 l = 1000 cm^3) **[1 mark]**

5. Xavier wants to fill a cubical tank of edge 24 cm completely. He pours bottles of water each with a capacity of 384 ml into the tank, one at a time. How many bottles of water will he need to fill the tank completely? **[2 marks]**

6. A tank 30 cm long, 12.5 cm wide and 20 cm high is $\frac{3}{4}$ filled with water. A tap is turned on for 3 minutes to fill the tank completely. (1 l = 1000 cm^3)

(a) How much water is needed to fill the tank to its brim? Express your answer in litres. **[2 marks]**

(b) Find the amount of water that flows from the tap per minute. **[1 mark]**

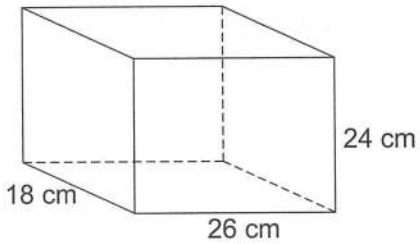
7. A fish pond measures 70 cm by 90 cm by 110 cm. It needs another 5880 cm^3 of water to fill it completely. Find the volume of water in the fish pond. Express your answer in litres. (1 l = 1000 cm^3) **[2 marks]**

8. A tank measuring 48 cm by 38 cm by 28 cm is 75% filled with water. How much water will be needed to fill the tank to its brim? **[2 marks]**

9. A pail can hold 1.5 *l* of water. A beaker is 5 cm long, 5 cm wide and 6 cm high. How many such beakers of water are needed to fill the pail to its brim? Assume the beakers are filled with water to the brim. (1 *l* = 1000 cm^3) **[2 marks]**

10. $\frac{2}{3}$ of a tank shown below is filled with water.

(a) Find the volume of water in the tank. **[1 mark]**



(b) If a block of ice, 13 cm by 16 cm by 9 cm, is lowered into the tank, find the new volume of water in the tank when the block of ice melts completely. Express your answer in litres. (1 *l* = 1000 cm^3) **[2 marks]**

11. Victor turns on a tap to fill a tank with a square base of side 40 cm and a height of 41.25 cm with water. Water from the tap flows into the tank at 4.5 litres per minute. How long should Victor turn the tap on if he wants to fill only $\frac{3}{4}$ of the tank? (1 l = 1000 cm^3) **[2 marks]**

Do Review 3 to practise on Area of Triangles, Ratio and Volume of Cubes and Cuboids.
Brush up on your Calculator Skills.
Go to **My SAPeducation App** or www.sapgrp.com
Test yourself! Do Revision Test 1 on units 1 to 8. Get your answers marked for Revision Test 1 by Geniebook! (See first page of book for instructions.)

9 Decimals

Multiply and divide decimals by tens, hundreds, thousands and their multiples

(A) Multiply these decimals. Write the correct answers on the lines provided. **[25 marks]**

Examples:

$3.56 \times 10 = \mathbf{35.6}$

$1.05 \times 500 = 1.05 \times 5 \times 100$

$= 5.25 \times 100$

$= \mathbf{525}$

$0.49 \times 8000 = 0.49 \times 8 \times 1000$

$= 3.92 \times 1000$

$= \mathbf{3920}$

1. $0.5 \times 10 =$ _____
2. $44.9 \times 10 =$ _____
3. $105.67 \times 10 =$ _____
4. $26.093 \times 10 =$ _____
5. $0.08 \times 100 =$ _____
6. $37.71 \times 100 =$ _____
7. $480.409 \times 100 =$ _____
8. $0.28 \times 1000 =$ _____
9. $184.6 \times 1000 =$ _____
10. $475.36 \times 1000 =$ _____
11. $0.32 \times$ _____ $= 3.2$
12. $0.7 \times$ _____ $= 70$

13. 90.01 × _____ = 9001

14. _____ × 10 = 1.48

15. _____ × 100 = 6.5

16. _____ × 1000 = 500

17. 0.2 × 40 = 0.2 × _____ × _____ = _____

18. 68.35 × 90 = 68.35 × _____ × _____ = _____

19. 9.4 × 300 = 9.4 × _____ × _____ = _____

20. 204.56 × 700 = 204.56 × _____ × _____ = _____

21. 50.9 × 6000 = 50.9 × _____ × _____ = _____

22. 74.21 × 3000 = 74.21 × _____ × _____ = _____

23. 1215 = _____ × 10 = _____ × 100 = _____ × 1000

24. 4849 = 484.9 × _____ = 48.49 × _____ = 4.849 × _____

25. 12 008 = _____ × 10 = _____ × 100 = _____ × 1000

(B) Divide these decimals. Write the correct answers on the lines provided. **[25 marks]**

Examples:

$45 \div 50 = 45 \div 5 \div 10$
$= 9 \div 10$
$= \mathbf{0.9}$

$61.5 \div 300 = 61.5 \div 3 \div 100$
$= 20.5 \div 100$
$= \mathbf{0.205}$

$2831 \div 1000 = \mathbf{2.831}$

1. $7 \div 10 =$ _____
2. $0.9 \div 10 =$ _____
3. $95.73 \div 10 =$ _____
4. $78.7 \div 100 =$ _____
5. $5461 \div 100 =$ _____
6. $425 \div 100 =$ _____
7. $616 \div 1000 =$ _____
8. $1003 \div 1000 =$ _____
9. $20\ 120 \div 1000 =$ _____
10. $71.62 \div$ _____ $= 7.162$
11. $187.9 \div$ _____ $= 1.879$
12. $807 \div$ _____ $= 0.807$

13. _____ ÷ 10 = 0.218

14. _____ ÷ 100 = 3.649

15. _____ ÷ 1000 = 0.092

16. _____ ÷ 1000 = 13.55

17. 2.4 ÷ 20 = 2.4 ÷ _____ ÷ _____ = _____

18. 4.05 ÷ 50 = 4.05 ÷ _____ ÷ _____ = _____

19. 84 ÷ 700 = 84 ÷ _____ ÷ _____ = _____

20. 178 ÷ 400 = 178 ÷ _____ ÷ _____ = _____

21. 90 ÷ 3000 = 90 ÷ _____ ÷ _____ = _____

22. 954 ÷ 6000 = 954 ÷ _____ ÷ _____ = _____

23. 6.27 = _____ ÷ 10 = _____ ÷ 100 = _____ ÷ 1000

24. 179.4 = _____ ÷ 10 = _____ ÷ 100 = _____ ÷ 1000

25. 24.8 = 24 800 ÷ _____ = 2480 ÷ _____ = 248 ÷ _____

Convert metres to centimetres, kilometres to metres, kilograms to grams and litres to millilitres

(A) Find the equivalent measures. Write the correct answers on the lines provided. **[28 marks]**

Example:

Convert 2.4 m to centimetres (cm). **240 cm**

1 m = 100 cm
2.4 m = 2.4 × 100
= 240 cm

1. Convert 7.05 m to centimetres (cm). _____

2. Convert 9.163 m to centimetres (cm). _____

3. Convert 100.2 m to centimetres (cm). _____

4. Convert 35.36 m to centimetres (cm). _____

5. Convert 228.577 m to centimetres (cm). _____

Example:

Convert 0.61 km to metres (m). **610 m**

1 km = 1000 m
0.61 km = 0.61 × 1000
= 610 m

6. Convert 1.755 km to metres (m). _____

7. Convert 24.82 km to metres (m). _____

8. Convert 69.95 km to metres (m). _____

9. Convert 117.4 km to metres (m). _____

10. Convert 205.512 km to metres (m). _____

Example:

Convert 8.02 kg to grams (g). **8020 g**

1 kg = 1000 g
8.02 kg = 8.02 × 1000
= 8020 g

11. Convert 5.105 kg to grams (g). _____

12. Convert 30.4 kg to grams (g). _____

13. Convert 171.7 kg to grams (g). _____

14. Convert 46.96 kg to grams (g). _____

15. Convert 0.258 kg to grams (g). _____

Example:

Convert 3.75 *l* to millilitres (m*l*). **3750 m*l***

1 *l* = 1000 m*l*

3.75 *l* = 3.75 × 1000

= 3750 m*l*

16. Convert 0.126 *l* to millilitres (m*l*). _____

17. Convert 8.103 *l* to millilitres (m*l*). _____

18. Convert 19.6 *l* to millilitres (m*l*). _____

19. Convert 20.09 *l* to millilitres (m*l*). _____

20. Convert 101.1 *l* to millilitres (m*l*). _____

21. Express 70.095 kg in kilograms and grams. _____

22. Express 66.04 *l* in litres and millilitres. _____

23. Express 13.96 m in metres and centimetres. _____

24. Express 45.5 km in kilometres and metres. _____

25. Express 4.137 *l* in litres and millilitres. _____

26. Express 8.016 km in kilometres and metres. _____

27. Express 312.4 m in metres and centimetres. _____

28. Express 4.58 kg in kilograms and grams. _____

Convert centimetres to metres, metres to kilometres, grams to kilograms and millilitres to litres

(B) Find the equivalent measures. Write the correct answers on the lines provided. **[28 marks]**

Example:

Convert 12 cm to metres (m). **0.12 m**

100 cm = 1 m
12 cm = 12 ÷ 100
= 0.12 m

1. Convert 439 cm to metres (m). _____

2. Convert 88.3 cm to metres (m). _____

3. Convert 969.5 cm to metres (m). _____

4. Convert 60 cm to metres (m). _____

5. Convert 7.7 cm to metres (m). _____

Example:

Convert 225 m to kilometres (km). **0.225 km**

1000 m = 1 km
225 m = 225 ÷ 1000
= 0.225 km

6. Convert 18 m to kilometres (km). _____

7. Convert 616 m to kilometres (km). _____

8. Convert 3504 m to kilometres (km). _____

9. Convert 9 m to kilometres (km). _____

10. Convert 1030 m to kilometres (km). _____

Example:

Convert 20 g to kilograms (kg). **0.02 kg**

1000 g = 1 kg
20 g = 20 ÷ 1000
= 0.02 kg

11. Convert 97 g to kilograms (kg). _____

12. Convert 402 g to kilograms (kg). _____

13. Convert 3610 g to kilograms (kg). _____

14. Convert 5 g to kilograms (kg). _____

15. Convert 890 g to kilograms (kg). _____

Example:

Convert 133 m*l* to litres (*l*). **0.133 *l***

1000 m*l* = 1 *l*
133 m*l* = 133 ÷ 1000
= 0.133 *l*

16. Convert 25 m*l* to litres (*l*). _____

17. Convert 708 m*l* to litres (*l*). _____

18. Convert 60 900 m*l* to litres (*l*). _____

19. Convert 5045 m*l* to litres (*l*). _____

20. Convert 34 010 m*l* to litres (*l*). _____

21. Express 52 m 40 cm as a decimal in metres. _____

22. Express 9 km 25 m as a decimal in kilometres. _____

23. Express 8 kg 9 g as a decimal in kilograms. _____

24. Express 98 *l* 200 m*l* as a decimal in litres. _____

25. Express 37 kg 35 g as a decimal in kilograms. _____

26. Express 528 *l* 5 m*l* as a decimal in litres. _____

27. Express 127 m 33 cm as a decimal in metres. _____

28. Express 580 km 600 m as a decimal in kilometres. _____

Solve word problems related to decimals and measurements

Do these word problems. Show your working clearly in the space provided.

1. A dozen similar T-shirts cost $162.60. How much does each T-shirt cost?

[1 mark]

2. Mrs Matthews bought 12.45 kg of prawns and $\frac{3}{4}$ kg of squids. If the prawns cost $30 per kg and the squids cost $18 per kg, how much did Mrs Matthews spend altogether?

[3 marks]

3. The mass of a metal container, together with 10 identical metal balls, is 79.15 kg. If the mass of the metal container is 16.75 kg, what is the mass of each metal ball? **[2 marks]**

4. Joey bought 17.3 m of cloth. $\frac{1}{5}$ of the cloth was damaged and she used the rest to make 4 similar sets of curtains.

   (a) How much cloth did Joey use to make one set of curtains? **[2 marks]**

   (b) If Joey sold each set of curtains for $19.90, how much money would she receive in all? **[1 mark]**

5. Susan divided 8.6 kg of sugar into 5 equal portions. She kept 2 such portions for herself and gave the rest to her sister. Her sister used 1.15 kg of sugar to bake some cakes. How much sugar had her sister left? **[3 marks]**

6. A box of pencils costs $3.25 and a box of coloured pencils costs $4.65. However, a box of pencils and a box of coloured pencils are sold together at $6.50. If Alex wants to buy 6 such boxes of pencils and 9 such boxes of coloured pencils, what is the least amount of money that Alex must pay? **[3 marks]**

7. The mass of a bag of rice is 5 kg. What is the total mass, in grams, of 15 such bags of rice? **[1 mark]**

8. A cleaner uses 36 pails of water to wash 9 toilets. The pail has a capacity of 5.5 litres. If she fills the pail of water to the brim each time, find the amount of water, in millilitres, she uses to wash each toilet. Assume she uses the same number of pails of water to clean each toilet. **[2 marks]**

9. A bus driver drives a distance of 21.95 km from one terminal to another. If the bus driver makes 3 such round trips each day, find the total distance, in metres, he drives per day. **[2 marks]**

10. A shopkeeper buys 6 cartons of canned drinks. There are 24 cans of drinks in each carton. Each can contains 390 m*l* of drinks. He empties all the cans of drinks into a big container for a charity show. How many litres of drinks are in the big container? **[2 marks]**

11. Sue uses 195 cm of ribbon to make 13 identical bookmarks. Find the length of ribbon, in metres, that she uses to make 175 such bookmarks. **[2 marks]**

12. A chef uses 175 g of flour to make a pizza.

(a) If he makes 255 such pizzas in 5 days, how many pizzas does the chef make in a year? Assume the chef makes pizzas every day in a year.

[2 marks]

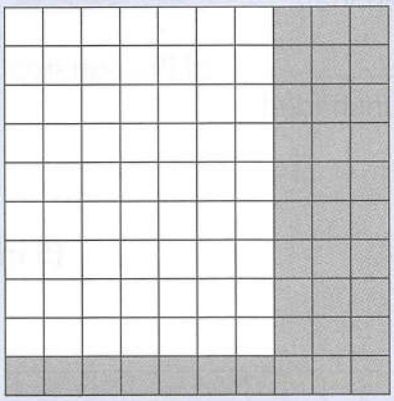
(b) How many kilograms of flour does the chef need in a year? **[1 mark]**

10 Percentage

Understand percent

(A) Fill in each blank with the correct answer. **[10 marks]**

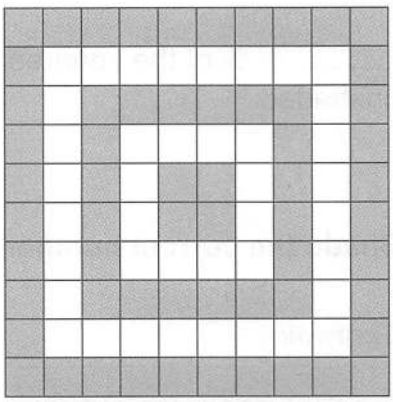
Example:



37 % of the squares are shaded.

63 % of the squares are unshaded.

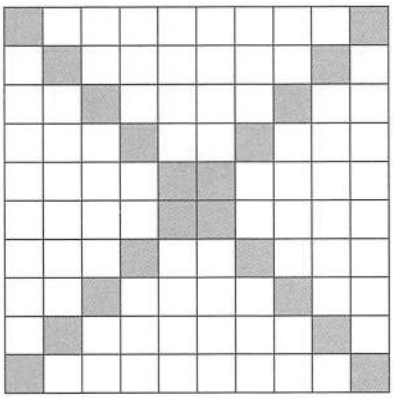
1.



_____ % of the squares are shaded.

_____ % of the squares are unshaded.

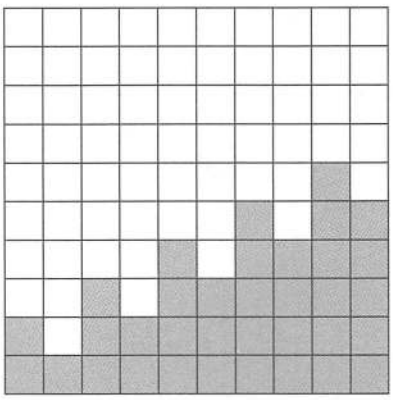
2.



_____ % of the squares are shaded.

_____ % of the squares are unshaded.

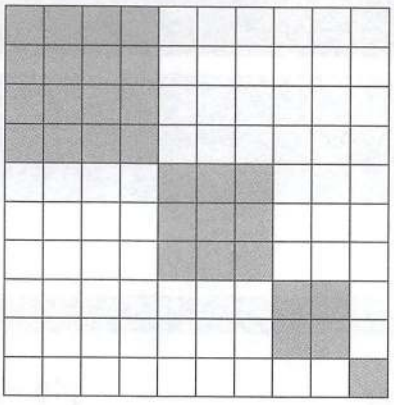
3.



_____ % of the squares are shaded.

_____ % of the squares are unshaded.

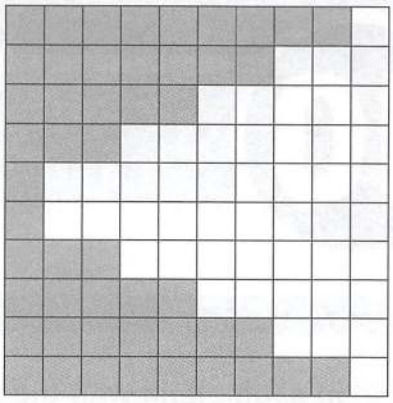
4.



_____% of the squares are shaded.

_____% of the squares are unshaded.

5.

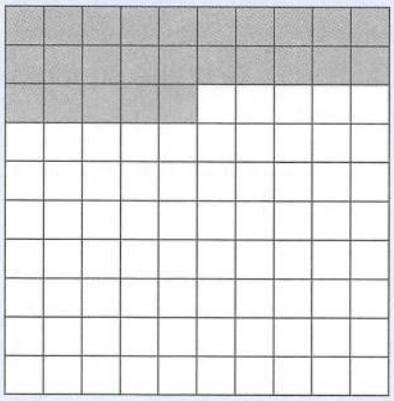


_____% of the squares are shaded.

_____% of the squares are unshaded.

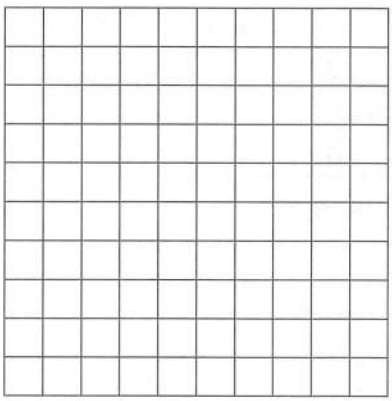
(B) Shade the correct number of squares. **[5 marks]**

Example:



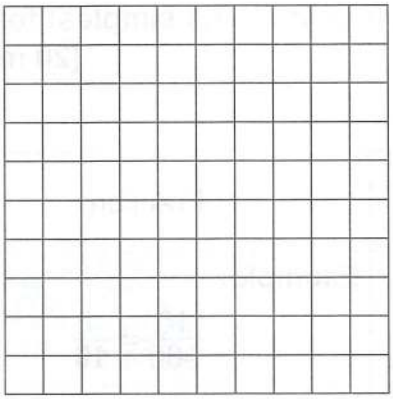
25%

1.



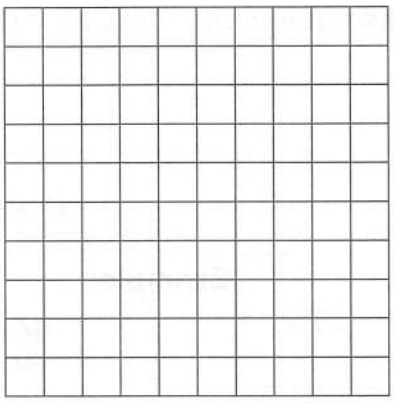
45%

2.



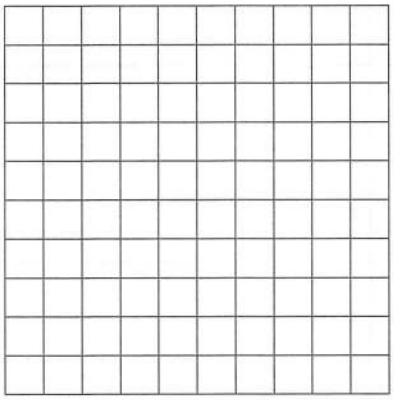
51%

3.



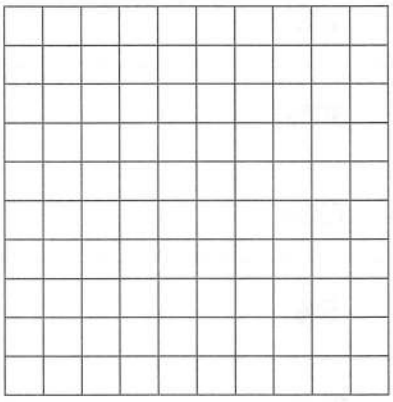
67%

4.



70%

5.



93%

Convert percentage to decimals or fractions

Express each percentage as a decimal and a fraction in its simplest form. **[20 marks]**

		Decimal	Fraction
	10%	**Example:** $\frac{10}{100} = 0.1$	**Example:** $\frac{\cancel{10}^{1}}{\cancel{100}_{10}} = \frac{1}{10}$
1.	20%		
2.	45%		
3.	2%		
4.	89%		
5.	72%		
6.	5%		
7.	36%		
8.	64%		
9.	98%		
10.	100%		

Convert decimals or fractions to percentage

(A) Express each decimal as a percentage. **[10 marks]**

Example:

0.15 = **15%** $0.15 = \frac{15}{100} = 15\%$

1. 0.3 = _____
2. 0.05 = _____
3. 0.65 = _____
4. 0.17 = _____
5. 0.94 = _____
6. 0.42 = _____
7. 0.58 = _____
8. 0.23 = _____
9. 0.76 = _____
10. 0.8 = _____

(B) Express each fraction as a percentage. **[10 marks]**

Example:

$\frac{1}{10} =$ **10%**

$\frac{1}{10} = \frac{10}{100} = 10\%$

1. $\frac{1}{2} =$ _____

2. $\frac{9}{10} =$ _____

3. $\frac{14}{25} =$ _____

4. $\frac{18}{200} =$ _____

5. $\frac{240}{400} =$ _____

6. $\frac{3}{4} =$ _____

7. $\frac{2}{5} =$ _____

8. $\frac{11}{20} =$ _____

9. $\frac{59}{100} =$ _____

10. $\frac{350}{500} =$ _____

Convert part of a quantity to percentage

Do these sums. **[15 marks]**

Example:

10% × 40 = 4 $\frac{10}{100} \times 40 = 4$

1. 20% × 150 = _____

2. 16% × $800 = _____

3. 80% × 55 kg = _____

4. 35% × 220 km = _____

5. 40% × $3300 = _____

6. 9% × $1000 = _____

7. 50% × 32 kg = _____

8. 24% of 400 *l* = _____

9. 92% of 550 cm = _____

10. 25% of 780 m/ = _____

11. 88% of 250 = _____

12. 64% of 450 = _____

13. 75% of 600 m = _____

14. 33% of 1900 g = _____

15. 48% of 325 km = _____

Calculate percentage based on quantity, and vice versa

Write your answers on the lines provided.

1. There are 100 apples in a bag. 43 of them are red apples and the rest are green apples. What percentage of the apples are green?

_____ **[2 marks]**

2. Jamie spelt 8 out of 10 words correctly in a spelling test. What percentage of the words did Jamie spell correctly?

_____ **[1 mark]**

3. Lionel had \$40. He spent $\frac{1}{4}$ of it and saved the rest. What percentage of the money did Lionel save?

_____ **[2 marks]**

4. There were 300 seats in a cinema. Only half of the seats were occupied. What percentage of the seats in the cinema were occupied?

_____ **[2 marks]**

5. 600 visitors went to the zoo last Sunday. 360 of them were children and the rest were adults. What percentage of the visitors were adults?

_____ **[2 marks]**

6. There are 40 students in a class. 35% of them wear spectacles. How many students do not wear spectacles?

_____ [2 marks]

7. A factory produces 800 computers in a week. In order to have a 20% increase in the production, how many computers must the factory produce in a week?

_____ [2 marks]

8. The original price of a television set was $2450. It was sold at a discount of 20% during a sale. What was the price of the television set during the sale?

_____ [2 marks]

9. Rita earns $1200 a month. She gives 15% of her earnings to her mother. How much does Rita give to her mother?

_____ [1 mark]

10. Pauline has $4000 in her savings account. The bank pays 4.5% interest per annum. How much interest will Pauline earn after a year?

_____ [1 mark]

Solve word problems related to percentage

Do these word problems. Show your working clearly in the space provided.

1. The original price of a bicycle was $900. Ronnie bought it at a discount of 20%. How much did Ronnie pay for the bicycle? **[2 marks]**

2. Nancy, Betty and Charlie shared some beads. Nancy received 35% of the beads while Betty received 25% of the beads.

   (a) What percentage of the beads did Charlie receive? **[1 mark]**

   (b) If Charlie had received 600 beads, how many beads did Nancy receive? **[2 marks]**

3. A shopkeeper had 80 kg of rice. He sold 45% of it to Mrs Philips and 20% of it to Mrs Jones. How much rice had the shopkeeper left? Express your answer in kilograms. **[2 marks]**

4. Trevor and his family went to a restaurant for dinner. The dinner cost them $375 excluding 7% GST (Goods and Services Tax). What was the total cost of the dinner? **[2 marks]**

5. A box contains blue, red and green pens. 25% of the pens are green and 35% of these are red. 48 blue pens cannot be used but the remaining 40% of the blue pens are usable.

(a) How many blue pens are there? **[2 marks]**

(b) How many pens are there altogether in the box? **[2 marks]**

6. A farmer has some chicken eggs and duck eggs. 60% of the eggs are chicken eggs while the rest are duck eggs. There are 420 more chicken eggs than duck eggs.

(a) What is the percentage difference between the chicken eggs and duck eggs? **[2 marks]**

(b) How many duck eggs does the farmer have? **[1 mark]**

(c) If each chicken egg is sold for 15 cents while each duck egg is sold for 23 cents, how much money does the farmer collect? Express your answer in dollars and cents. **[2 marks]**

7. Karen bought a portable DVD player at a discount of 15%. The usual price of the portable DVD player was $890.

(a) How much was the portable DVD player after the discount? **[2 marks]**

(b) If Karen paid for the portable DVD player in 5 monthly instalments, how much did she pay each month? **[1 mark]**

8. A man left behind $250 000 for his wife and 3 children. His wife received 45% of that sum of money while his only son received 33% of the money. His two daughters shared the rest of the money equally.

(a) How much did his wife receive? **[1 mark]**

(b) How much did his son receive? **[1 mark]**

(c) How much did each of his daughters receive? **[2 marks]**

11 Average

Understand the concept of average

Write the correct answers on the lines provided. **[12 marks]**

Example:

(a) Find the total of 8, 11 and 14. **33**

8 + 11 + 14 = 33

(b) Find the average. **11**

Average = Total Number ÷ Number of Items
= 33 ÷ 3
= 11

1. (a) Find the total of $15, $18 and $60. _____

(b) Find the average. _____

2. (a) Find the total of 268 kg, 208 kg and 109 kg. _____

(b) Find the average. _____

3. (a) Find the total of 147 m*l*, 96 m*l* and 114 m*l*. _____

(b) Find the average. _____

4. (a) Find the total of 35 cm, 81 cm, 66 cm and 94 cm.

_____

(b) Find the average. _____

5. (a) Find the total of 358 *l*, 92 *l*, 189 *l* and 93 *l*. _____

(b) Find the average. _____

6. (a) Find the total of 293 m, 158 m, 431 m and 126 m. _____

(b) Find the average. _____

Calculate average

Calculate the average of each of the following. **[20 marks]**

1. 6, 9 and 15 _____

2. 1, 11 and 21 _____

3. 48.7 km, 99.3 km and 132.5 km _____

4. 268 g, 804 g and 539 g _____

5. $3.50, $6.05 and $11 _____

6. 14, 56, 73 and 105 _____

7. 64, 120, 96 and 148 _____

8. 15.5 *l*, 8.7 *l*, 5.3 *l* and 3.9 *l* _____

9. 24.3 m, 36.16 m, 58.9 m and 70.24 m _____

10. 6.175 kg, 8.23 kg, 11.205 kg and 14.19 kg _____

11. 10, 20, 30, 40 and 50 _____

12. 9, 18, 36, 72 and 126 _____

13. $2.40, $4.90, $7.80, $10.10 and $12.30 _____

14. 0.75 kg, 1.4 kg, 3.36 kg, 9.6 kg and 21.09 kg _____

15. 46 min, 52 min, 84 min, 93 min and 106 min _____

16. 7, 8, 10, 65, 121 and 143 _____

17. 45, 87, 132, 190, 216 and 248 _____

18. 4.4 m, 5.35 m, 9.8 m, 13.02 m, 17.1 m and 20.53 m _____

19. 0.17 *l*, 2.035 *l*, 6.44 *l*, 7.952 *l*, 11.26 *l* and 14.599 *l* _____

20. 55.08 km, 67.474 km, 92.23 km, 101.995 km, 124.76 km and 178.507 km _____

Calculate total number based on average and number of items given

Write the correct answers on the lines provided. **[8 marks]**

1. The average of 3 numbers is 17. Find the total. _____

2. The average of 3 numbers is 154.4. Find the total. _____

3. The average of 4 numbers is 68. Find the total. _____

4. The average of 4 numbers is 103.2. Find the total. _____

5. The average of 5 numbers is 10.5. Find the total. _____

6. The average of 5 numbers is 131.69. Find the total. _____

7. The average of 6 numbers is 23.46. Find the total. _____

8. The average of 6 numbers is 150.783. Find the total. _____

Solve word problems related to average

Do these word problems. Show your working clearly in the space provided.

1. The table below shows the amount of money Alan saved over five consecutive months.

April	May	June	July	August
$200	$180	$280	$300	$265

What was the average amount of money Alan had saved over this period of time?

[2 marks]

2. The table below shows the height of four boys.

Adam	Bob	Daniel	Timothy
145 cm	152 cm	?	150 cm

If the average height of the four boys is 146.5 cm, find Daniel's height.

[3 marks]

3. The table below shows the marks scored by Rose in an examination.

Subjects	English	Mathematics	Science	Mother Tongue
Marks	72	85	70	79

(a) Find the total marks of the four subjects. **[1 mark]**
(b) Find the average marks of the four subjects. **[1 mark]**

4. The table below shows different types of vehicles that passed by a shop in a day.

Types of vehicles	Cars	Vans	Motorcycles	Buses	Bicycles
Number of vehicles	608	411	?	227	?

If the average number of vehicles that passed by the shop that day was 369 and the number of motorcycles was 569 more than the number of bicycles, find the number of bicycles that passed by the shop that day. **[4 marks]**

5. The average of four numbers is 24.5. If three of the numbers are 16, 47 and 25, what is the last number? **[3 marks]**

6. A shopkeeper sold an average of 329 cans of drinks in a week at a funfair. If he had sold an average of 250 cans of drinks for the first five days, how many cans of drinks were sold during the last two days? **[3 marks]**

7. A box containing some similar pens has a mass of 12.8 kg. The box has a mass of 800 g when it is empty. If the average mass of all the pens is 160 g, how many pens are there in the box? **[2 marks]**

8. There are 22 girls and 18 boys in a class. If the total pocket money of all the boys is $27 and the average pocket money of all the girls is $0.90, find the average pocket money of all the students in the class. **[3 marks]**

9. Find the average of all the whole numbers ranging from 1 to 20. **[2 marks]**

10. There are some green and red apples in a box. The total mass of all the green apples is 5250 g. The total mass of all the apples is 8450 g. Find the number of red apples in the box if the average mass of all the red apples is 200 g. **[2 marks]**

11. Uncle Ron had 10 boxes of red pens and 15 boxes of blue pens. There were 47 red pens in each box. He sold 326 red pens and 471 blue pens. If he had 453 pens left,

(a) find the number of blue pens Uncle Ron had left. **[3 marks]**

(b) how many blue pens were there in each box? **[2 marks]**

12. Gina and Mary have an average of 41 stickers. Gina and Valerie have an average of 48 stickers. Valerie has 3 times as many stickers as Gina.

(a) How many stickers does Valerie have? **[3 marks]**

(b) How many more stickers does Mary have than Gina? **[2 marks]**

Do Review 4 to practise on Decimals, Percentage and Average.
Try the challenging Non-Rontine Questions 2 for further application.
Go to **My SAPeducation App** or www.sapgrp.com

12 Rate

Understand rate

Fill in each blank with the correct answer. **[5 marks]**

Example:

1 Singapore Dollar can be exchanged for 3.13 Malaysian Ringgit. How much Malaysian Ringgit can 5 Singapore Dollars be exchanged for?

$ 1 SGD = RM 3.13

$ 5 SGD = 5 × 3.13

= RM 15.65

1. How much Singapore Dollar can 1 Malaysian Ringgit be exchanged for? (Give your answer to 2 decimal places.)

RM_____ = $_____

RM_____ = _____ × _____

= $_____ SGD

2. 100 Singapore Dollars can be exchanged for 70.40 US Dollars. How much US Dollars can 24 Singapore Dollars be exchanged for? (Give your answer to 2 decimal places.)

$_____ SGD = $_____ USD

$_____ SGD = _____ ÷ _____ = $_____ USD

$_____ SGD = _____ × _____ = $_____ USD

3. Machine A can produce 450 items in 3 hours. At this rate, how many items can it produce in 5 hours?

_____ h → _____ items

_____ h → _____ ÷ _____

= _____ items

_____ h → _____ × _____

= _____ items

4. Machine B can produce 480 items in 2 hours. At this rate, how many items can it produce in 48 minutes?

_____ min → _____ items

_____ min → _____ ÷ _____

= _____ items

_____ min → _____ × _____

= _____ items

5. Madeline can type 50 words in a minute. At this rate, how long will she take to type a 2000-word essay?

_____ words → _____ min

_____ word → _____ ÷ _____

= _____ min

_____ words → _____ × _____

= _____ min

Solve word problems related to rate

Do there word problems. Show your working clearly in the space provided. [10 marks]

1. Nestor takes 1 hour and 40 minutes to type a 5500-word essay. What is his typing speed?

2. A worker is paid $8.50 an hour. At this rate, how much will he be paid if he works 8 hours every day from Thursday to Tuesday?

3. Brother's jogging speed is 120 metres per minute. At this rate, how many laps around a 400-metre track will he cover if he jogs for 20 minutes?

4. Sister's cycling speed is 16 kilometres per hour. At this rate, how far will she cycle in 36 minutes?

5. The postage cost for mailing a letter is 25¢. Father wants to mail 25 letters. At this rate, how much will it cost him?

6. Mother uses 250 g of flour to bake a muffin. If she has 2.1 kg of flour, how many full muffins can she bake?

7. Water is leaking from a faulty tap at 35 m*l* per second. At this rate, how much water has leaked from the tap after 3 minutes? (Give your answer in litres and millilitres.)

8. It takes a water pump $4\frac{1}{2}$ minutes to fill an 18-litre fish tank to capacity. What is the rate of the water pump?

9. A lorry uses 5 *l* of petrol after travelling 75 km. How many kilometres can the lorry travel on 1 *l* of petrol?

10. It costs \$80 to paint an area of 200 m^2. At this rate, how much will it cost to paint an area of 700 m^2?

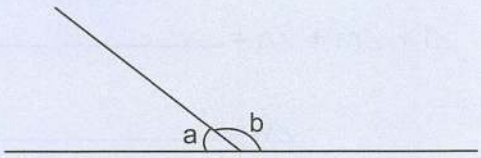
13 Angles

Recognise and understand angles on a straight line, angles at a point and vertically opposite angles

(A) Measure each marked angle with a protractor. Write your answers on the lines provided. **[60 marks]**

Angles on a straight line

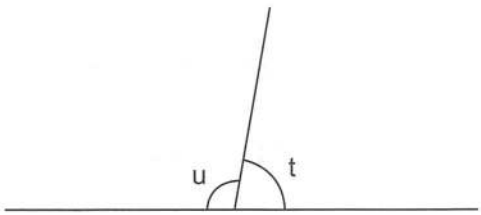
Example:



$\angle a + \angle b = 180°$

Sum of angles on a straight line is 180°.

1.

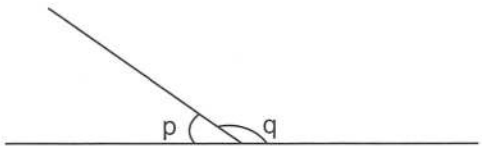


$\angle t$ = _____

$\angle u$ = _____

$\angle t + \angle u$ = _____

2.

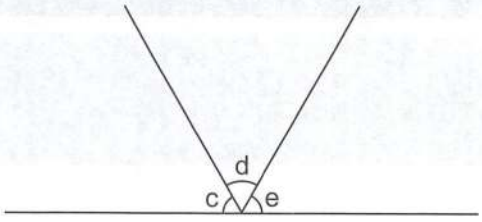


$\angle p$ = _____

$\angle q$ = _____

$\angle p + \angle q$ = _____

3.



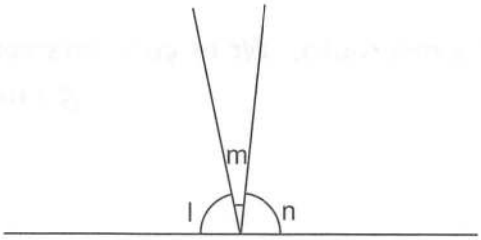
$\angle c =$ _____

$\angle d =$ _____

$\angle e =$ _____

$\angle c + \angle d + \angle e =$ _____

4.



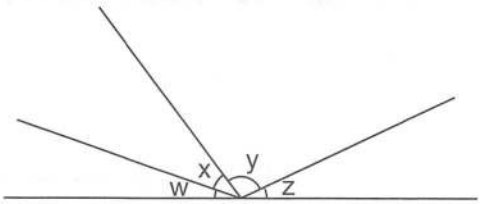
$\angle l =$ _____

$\angle m =$ _____

$\angle n =$ _____

$\angle l + \angle m + \angle n =$ _____

5.



$\angle w =$ _____

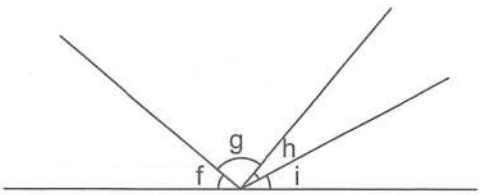
$\angle x =$ _____

$\angle y =$ _____

$\angle z =$ _____

$\angle w + \angle x + \angle y + \angle z =$ _____

6.



$\angle f =$ _____

$\angle g =$ _____

$\angle h =$ _____

$\angle i =$ _____

$\angle f + \angle g + \angle h + \angle i =$ _____

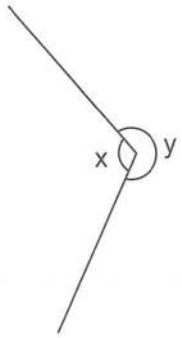
Angles at a point

Example:

$\angle a + \angle b = 360°$

Sum of angles at a point is 360°.

7.

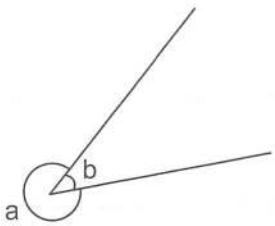


$\angle x =$ _____

$\angle y =$ _____

$\angle x + \angle y =$ _____

8.

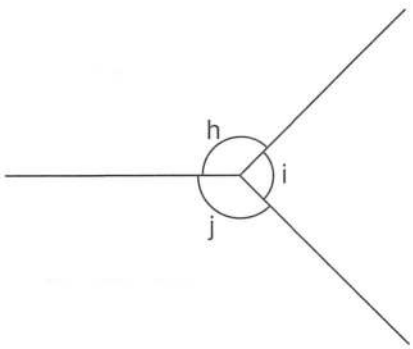


$\angle a =$ _____

$\angle b =$ _____

$\angle a + \angle b =$ _____

9.



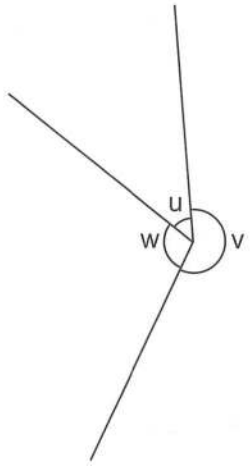
$\angle h =$ _____

$\angle i =$ _____

$\angle j =$ _____

$\angle h + \angle i + \angle j =$ _____

10.



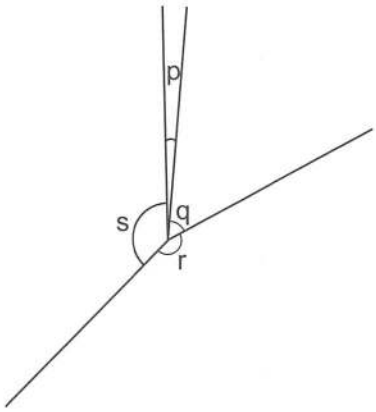
$\angle u =$ _____

$\angle v =$ _____

$\angle w =$ _____

$\angle u + \angle v + \angle w =$ _____

11.



$\angle p =$ _____

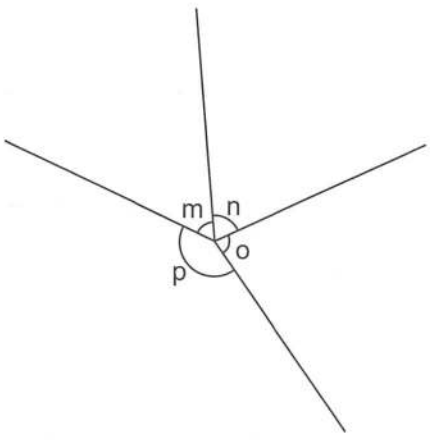
$\angle q =$ _____

$\angle r =$ _____

$\angle s =$ _____

$\angle p + \angle q + \angle r + \angle s =$ _____

12.



$\angle m =$ _____

$\angle n =$ _____

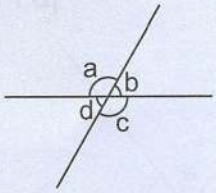
$\angle o =$ _____

$\angle p =$ _____

$\angle m + \angle n + \angle o + \angle p =$ _____

Vertically opposite angles

Example:

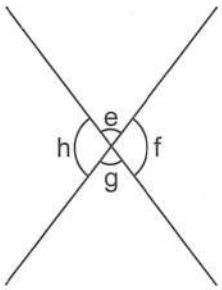


$\angle a = \angle c$

$\angle b = \angle d$

Vertically opposite angles are equal.

13.



$\angle e =$ _____

$\angle f =$ _____

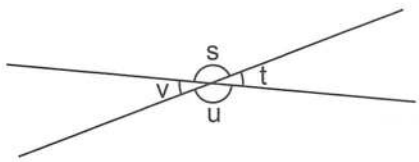
$\angle g =$ _____

$\angle h =$ _____

$\angle$ _____ and $\angle$ _____ are vertically opposite angles.

$\angle$ _____ and $\angle$ _____ are also vertically opposite angles.

14.



$\angle s =$ _____

$\angle t =$ _____

$\angle u =$ _____

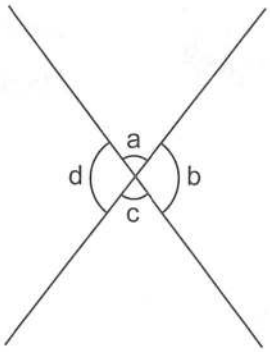
$\angle v =$ _____

$\angle$ _____ and $\angle$ _____ are vertically opposite angles.

$\angle$ _____ and $\angle$ _____ are also vertically opposite angles.

(B) Fill in each blank with the correct answer.

1. Measure these marked angles with a protractor. Then fill in each blank with the correct answer. **[8 marks]**



(a) ∠a = _____

∠b = _____

∠c = _____

∠d = _____

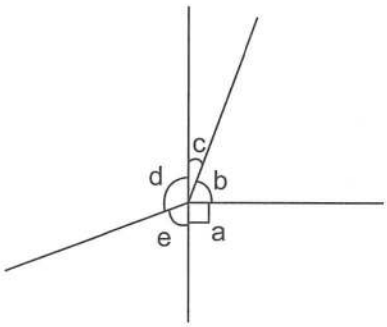
(b) ∠a and ∠c are _____ angles.

(c) ∠b and ∠d are _____ angles.

(d) ∠a and ∠b are _____.

(e) ∠a, ∠b, ∠c and ∠d are _____.

2. Fill in each blank with the correct answer. **[4 marks]**



(a) What is the sum of ∠a, ∠b and ∠c? _____

(b) Identify the angles on a straight line. _____

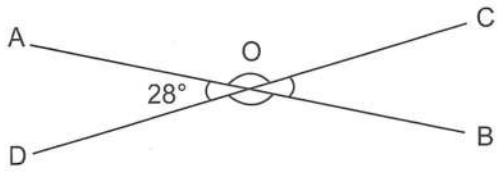
(c) Which two angles can form a right angle? _____

(d) What is the sum of ∠b, ∠c, ∠d and ∠e? _____

Use angle properties to find unknown angles

Each figure is not drawn to scale. Find the unknown angles.

1. AB and CD are straight lines. Find the unknown angles. **[3 marks]**

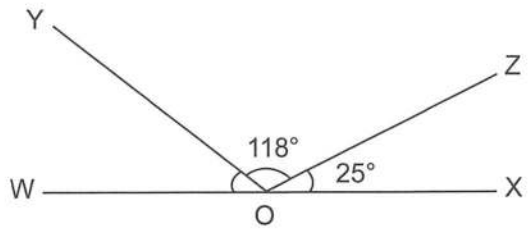


∠AOC = _____

∠DOB = _____

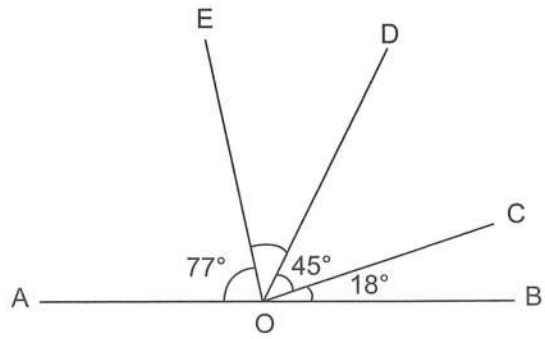
∠COB = _____

2. WOX is a straight line. Find ∠WOY. **[1 mark]**



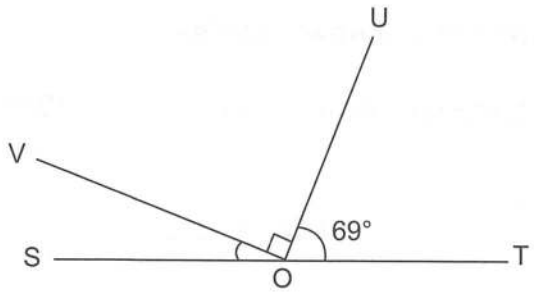
_____

3. AOB is a straight line. Find ∠DOE. **[1 mark]**

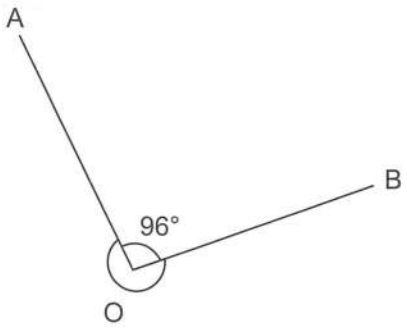


_____

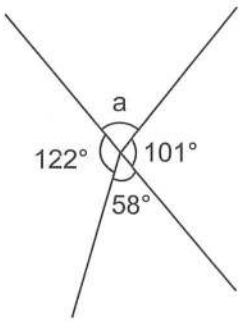
4. SOT is a straight line. Find ∠SOV. **[1 mark]**



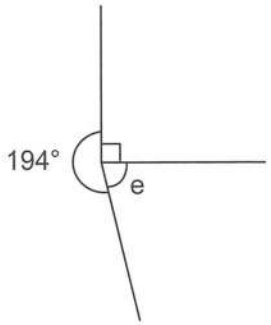
5. Find ∠AOB. **[1 mark]**



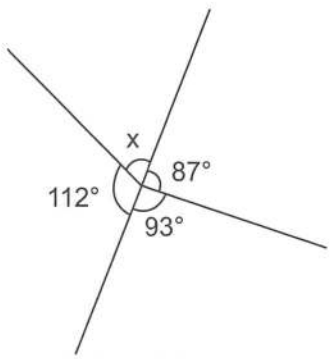
6. Find ∠a. **[1 mark]**



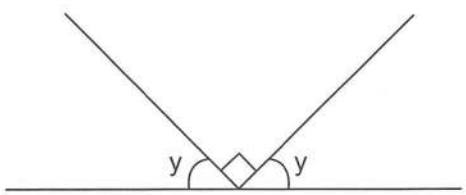
7. Find ∠e. **[1 mark]**



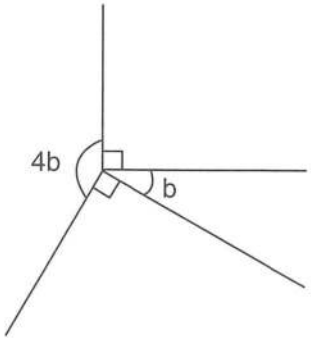
8. Find ∠x. **[1 mark]**



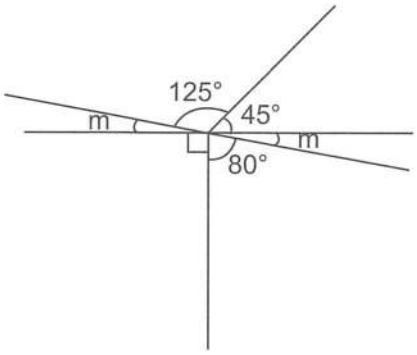
9. Find ∠y. **[1 mark]**



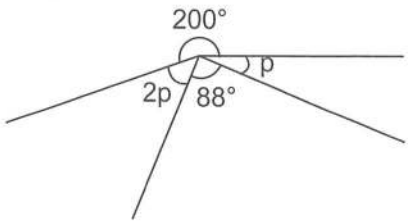
10. Find ∠b and ∠4b. **[2 marks]**



11. Find ∠m. **[1 mark]**



12. Find ∠p and ∠2p. **[2 marks]**

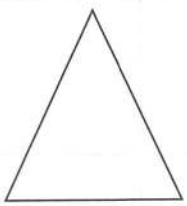
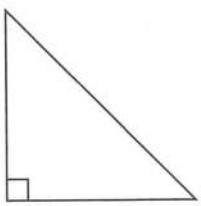
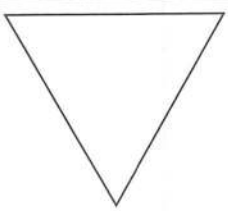
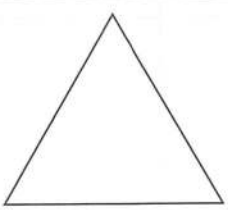
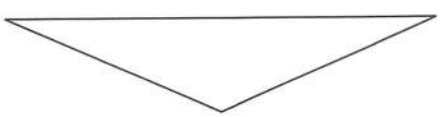


Do Review 5 to practise on Rate and Angles.
Go to **My SAPeducation App** or www.sapgrp.com

14 Triangles

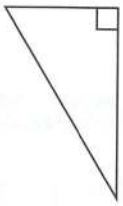
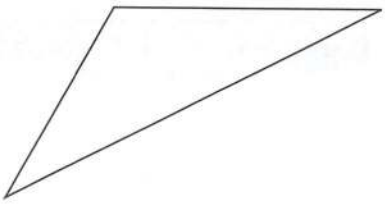
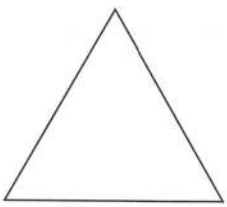
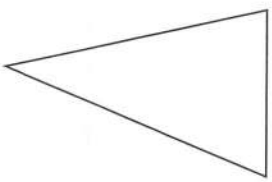
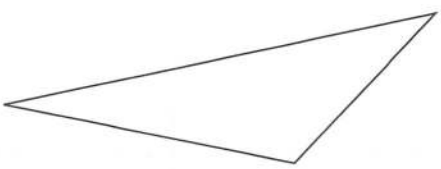
Classify triangles

(A) Identify each type of triangle by putting a tick (✓) in the correct box. [5 marks]

	Triangle	Equilateral	Isosceles
1.			
2.			
3.			
4.			
5.			

(B) Identify each type of triangle by putting a tick (✓) in the correct box.

[5 marks]

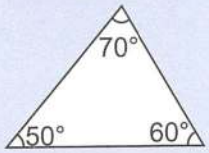
	Triangle	Right	Acute	Obtuse
1.				
2.				
3.				
4.				
5.				

Recognise and find unknown angles in different triangles: right-angled, isosceles and equilateral triangles

(A) These triangles are not drawn to scale. Find each unknown angle. **[10 marks]**

Property of a triangle

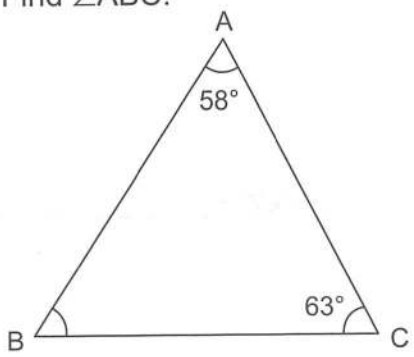
Example:



50° + 60° + 70° = 180°

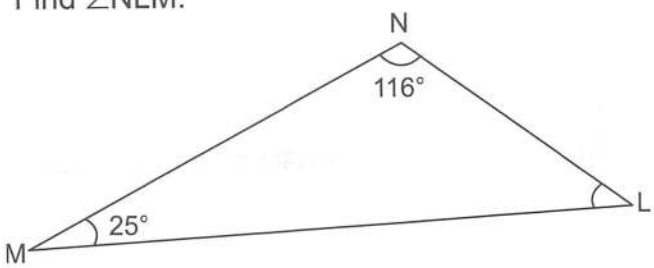
The sum of all angles in the triangle is 180°.

1. Find ∠ABC.



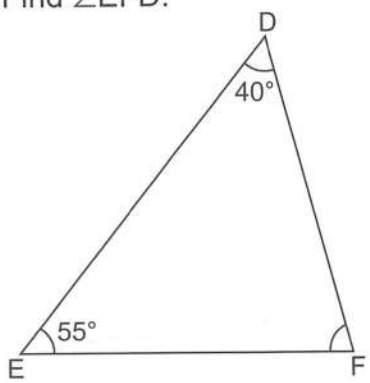
∠ABC = _____

2. Find ∠NLM.



∠NLM = _____

3. Find ∠EFD.

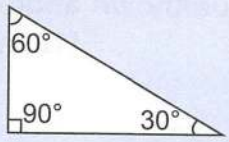


∠EFD = _____

Right-angled triangles

Properties of a right-angled triangle

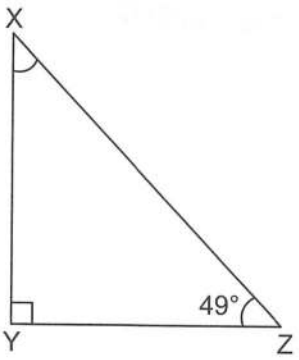
Example:



$60° + 30° = 90°$

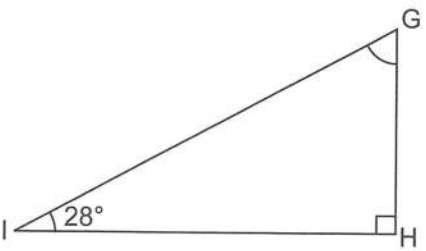
- One angle is 90°.
- The sum of the other two angles is 90°.

4. Find ∠YXZ.



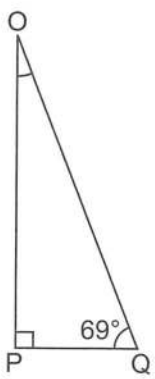
∠YXZ = _____

5. Find ∠IGH.



∠IGH = _____

6. Find ∠QOP.

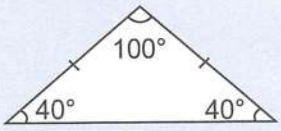


∠QOP = _____

Isosceles triangles

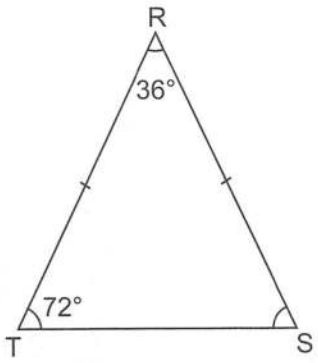
Properties of an isosceles triangle

Example:



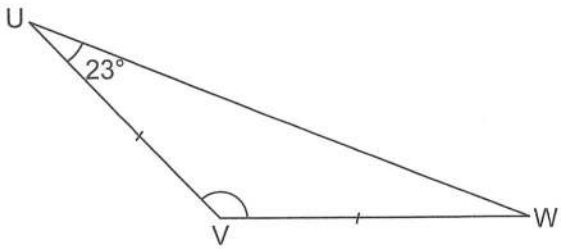
- It has two equal sides.
- It has two equal angles.

7. Find ∠RST.



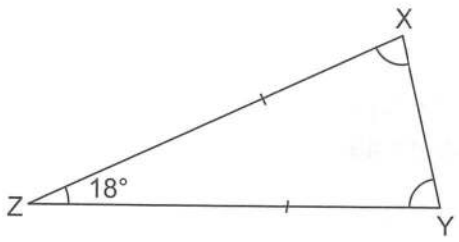
∠RST = _____

8. Find ∠UVW.



∠UVW = _____

9. Find ∠YXZ.

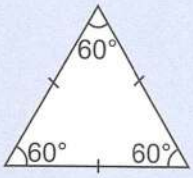


∠YXZ = _____

Equilateral triangles

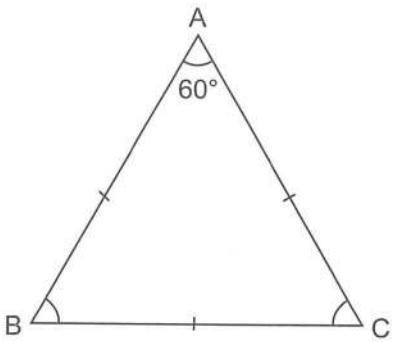
Properties of an equilateral triangle

Example:



- It has three equal sides.
- It has three equal angles.

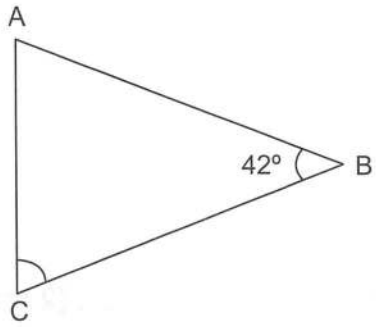
10. Find ∠ACB.



∠ACB = _____

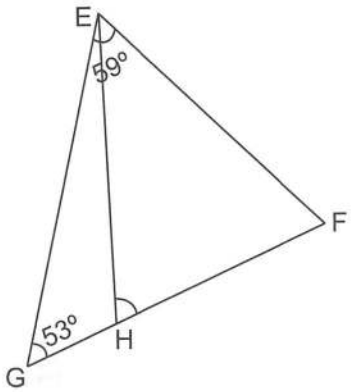
(B) The figures below are not drawn to scale. Find the angles and write your answers on the lines provided.

1. In triangle ABC, AB = BC and ∠ABC = 42°. Find ∠ACB.



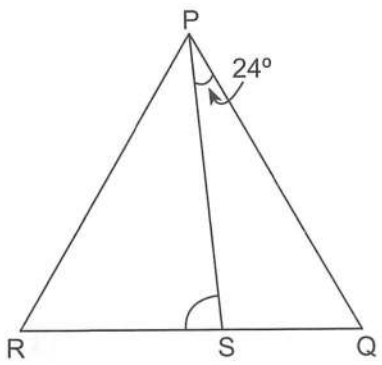
∠ACB = _____ **[1 mark]**

2. In triangle EFG, EH = EF, ∠EGF = 53° and ∠GEF = 59°. Find ∠EHF.



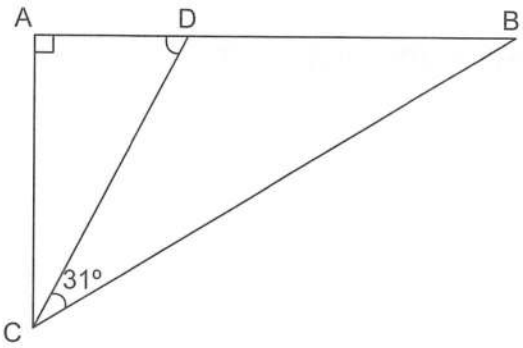
∠EHF = _____ **[1 mark]**

3. In equilateral triangle PQR, ∠QPS = 24°. Find ∠PSR.



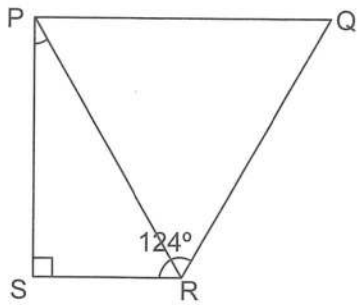
∠PSR = _____ **[2 marks]**

4. In triangle ABC, DB = DC and ∠DCB = 31°. Find ∠ADC.



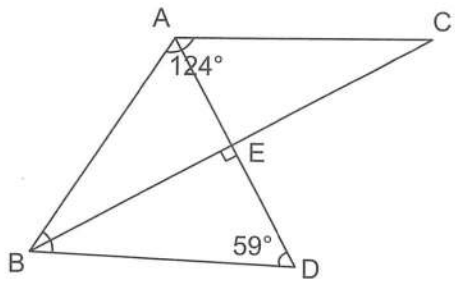
∠ADC = _____ **[2 marks]**

5. PSR is a right-angled triangle and PQR is an equilateral triangle. ∠SRQ is 124°. Find ∠SPR.



∠SPR = _____ **[2 marks]**

6. In triangle ABC, AB = AC and ∠BAC = 124°. In triangle BDE, ∠BED = 90° and ∠EDB = 59°. Find ∠ABD.

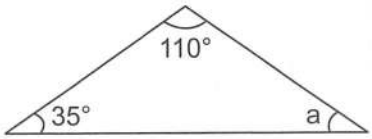


∠ABD = _____ **[3 marks]**

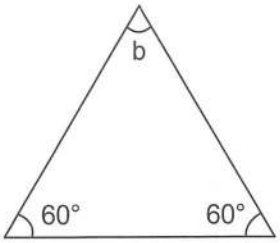
(C) These figures are not drawn to scale. Find each unknown marked angle. Write your answers on the lines provided in the box. Identify the type of triangle by putting a tick (✓) in the correct box if applicable.

[12 marks]

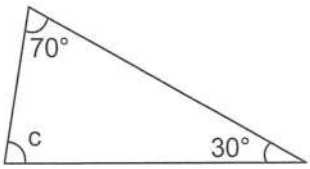
1.



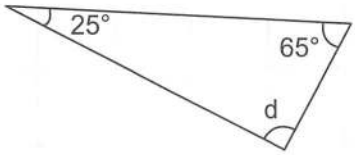
2.



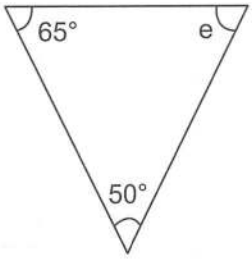
3.



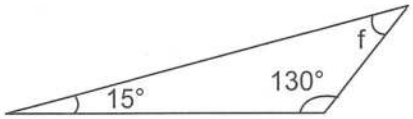
4.



5.



6.

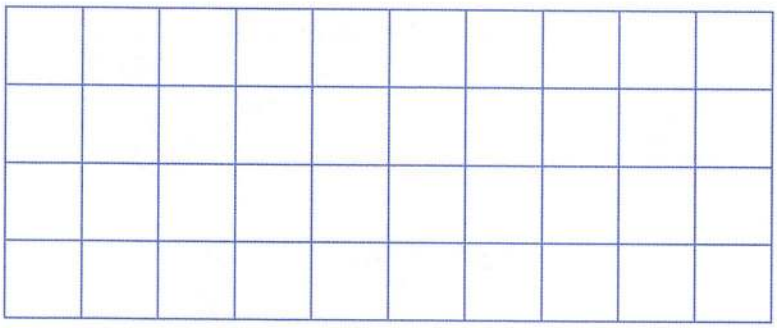


	Angles	Isosceles triangle	Equilateral triangle	Right-angled triangle
1.	∠a = _____ °			
2.	∠b = _____ °			
3.	∠c = _____ °			
4.	∠d = _____ °			
5.	∠e = _____ °			
6.	∠f = _____ °			

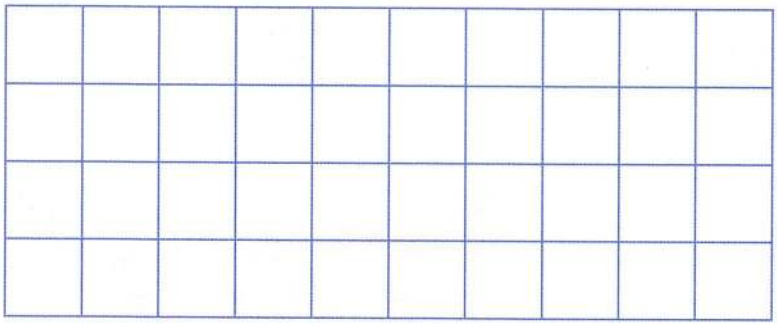
Draw triangles

(A) Draw each type of triangle in the grid provided. **[8 marks]**

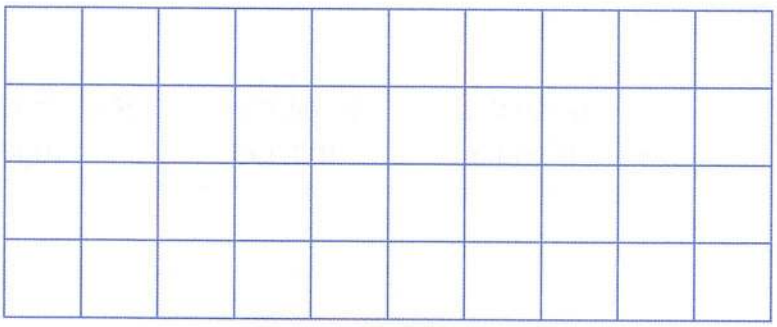
1. Isosceles



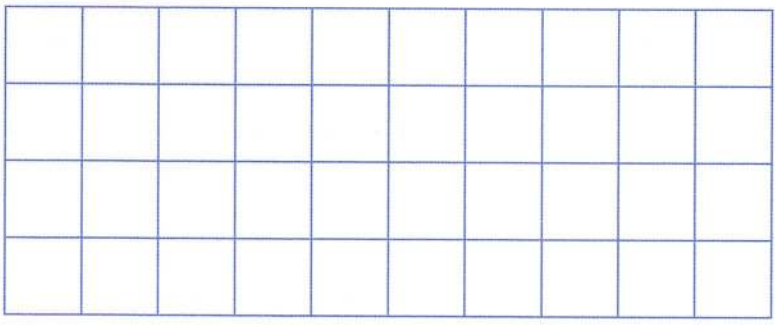
2. Right



3. Acute



4. Obtuse



(B) Draw each triangle in the space provided. **[6 marks]**

1. Equilateral triangle ABC of side 5 cm.

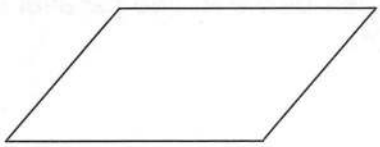
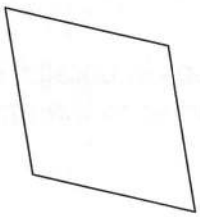
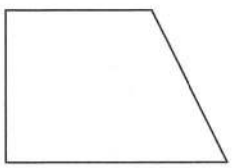
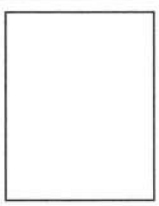
2. Isosceles triangle DFE in which DE = EF = 6 cm and $\angle DEF = 30°$.

3. Right-angled triangle GHI in which GH = 4.5 cm, GI = 4 cm and ∠HGI = 90°.

15 Quadrilaterals

Classify quadrilaterals

Identify each type of quadrilateral by putting a tick (✓) in the correct box.
[5 marks]

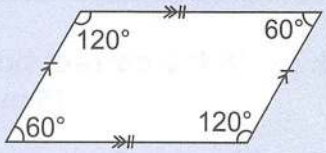
	Triangle	Parallelogram	Rhombus	Trapezium
1.				
2.				
3.				
4.				
5.				

Recognise and find unknown angles in a parallelogram, rhombus and trapezium

The following 4-sided figures are not drawn to scale. Find each unknown marked angle. **[11 marks]**

Properties of a parallelogram

Example:

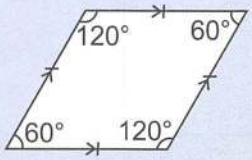


$120° + 60° = 180°$

- Opposite sides are equal and parallel.
- Opposite angles are equal.
- The pair of angles between two parallel sides adds up to 180°.

Properties of a rhombus

Example:

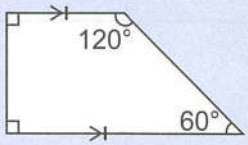


$120° + 60° = 180°$

- It has 4 equal sides.
- Opposite sides are parallel.
- Opposite angles are equal.
- The pair of angles between two parallel sides adds up to 180°.

Properties of a trapezium

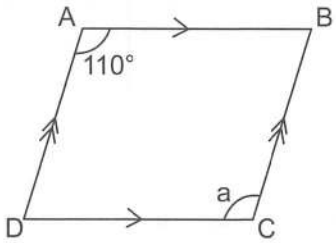
Example:



$90° + 90° = 180°$
$120° + 60° = 180°$

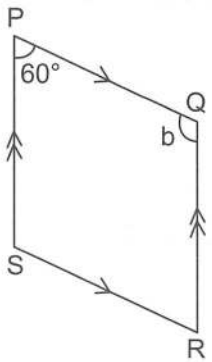
- It has one pair of opposite parallel sides.
- The pair of angles between the parallel sides adds up to 180°.

1.



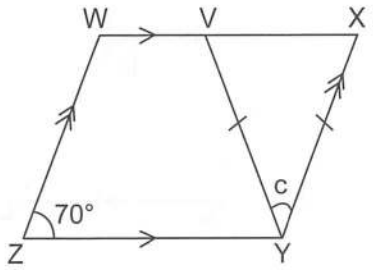
$\angle a =$ _____

2.



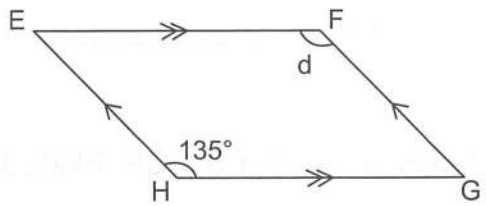
$\angle b =$ _____

3.



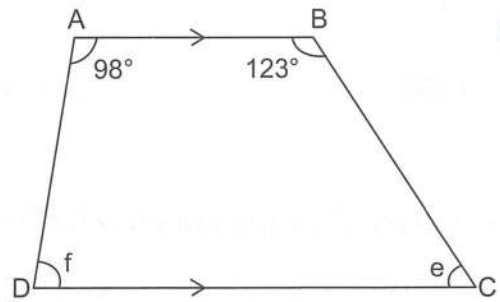
$\angle c =$ _____

4.



$\angle d =$ _____

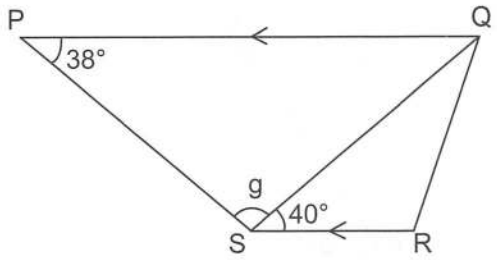
5.



$\angle e =$ _____

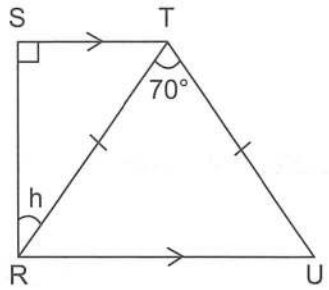
$\angle f =$ _____

6.



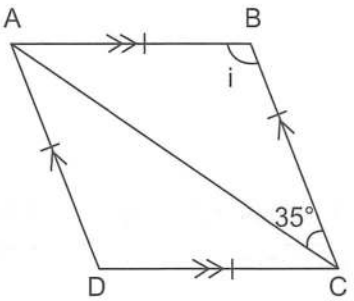
$\angle g =$ _____

7.



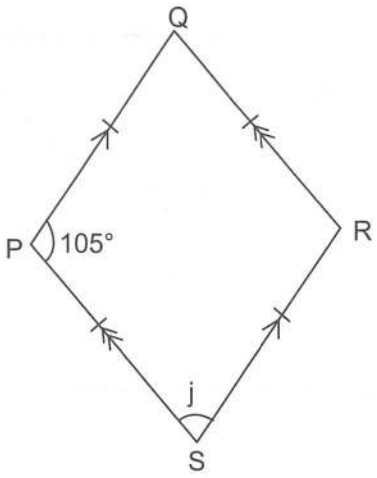
$\angle h =$ _____

8.



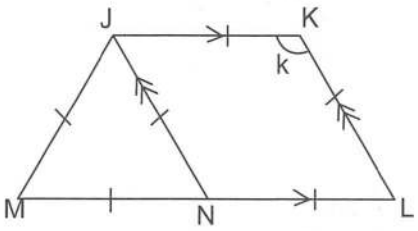
$\angle i =$ _____

9.



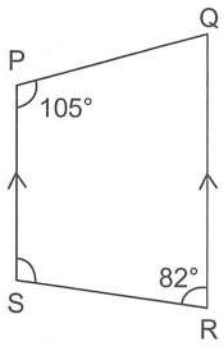
$\angle j =$ _____

10.



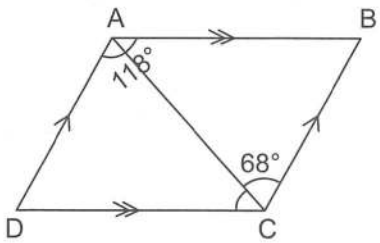
$\angle k =$ _____

11. The figure, not drawn to scale, is a trapezium where PS // QR. Find $\angle PSR$.



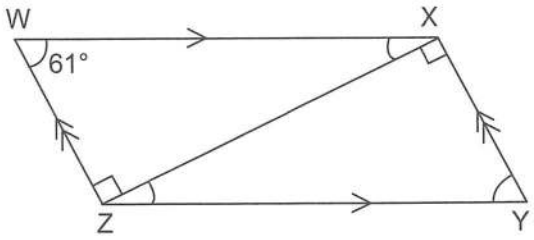
$\angle PSR =$ _____ **[1 mark]**

12. The figure is not drawn to scale. ABCD is a parallelogram where $\angle BAD = 118°$ and $\angle BCA = 68°$. Find $\angle ACD$.



$\angle ACD =$ _____ **[1 mark]**

13. The figure is not drawn to scale. WXYZ is a parallelogram where $\angle WZX = 90°$, $\angle ZXY = 90°$ and $\angle ZWX = 61°$. Find $\angle WXZ$, $\angle XZY$ and $\angle XYZ$.

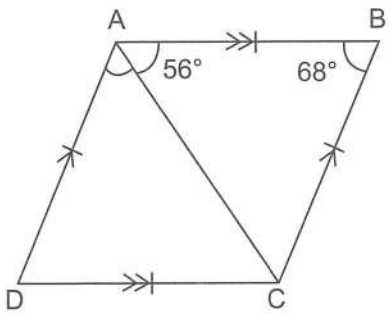


$\angle WXZ =$ _____ **[1 mark]**

$\angle XZY =$ _____ **[2 marks]**

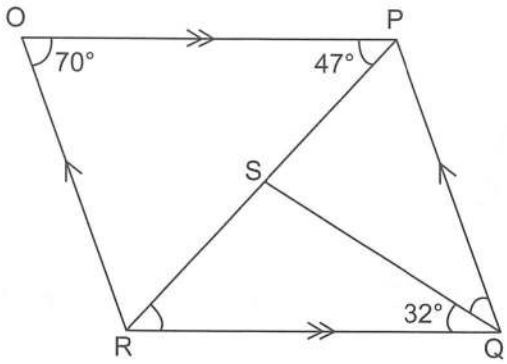
$\angle XYZ =$ _____ **[1 mark]**

14. The figure is not drawn to scale. ABCD is a rhombus where $\angle ABC = 68°$ and $\angle BAC = 56°$. Find $\angle CAD$.



$\angle CAD =$ _____ **[1 mark]**

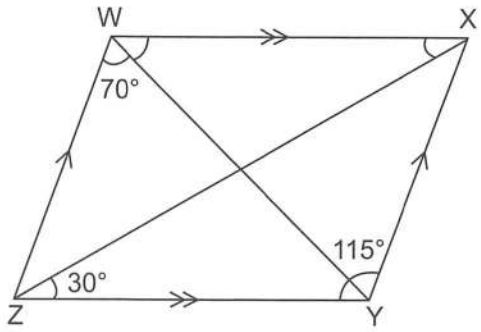
15. The figure is not drawn to scale. OPQR is a parallelogram where $\angle ROP = 70°$, $\angle OPR = 47°$ and $\angle RQS = 32°$. Find $\angle PQS$ and $\angle QRS$.



$\angle PQS =$ _____ **[1 mark]**

$\angle QRS =$ _____ **[3 marks]**

16. The figure is not drawn to scale. WXYZ is a parallelogram where $\angle ZWY = 70°$, $\angle XZY = 30°$ and $\angle ZYX = 115°$. Find $\angle YWX$ and $\angle WXZ$.



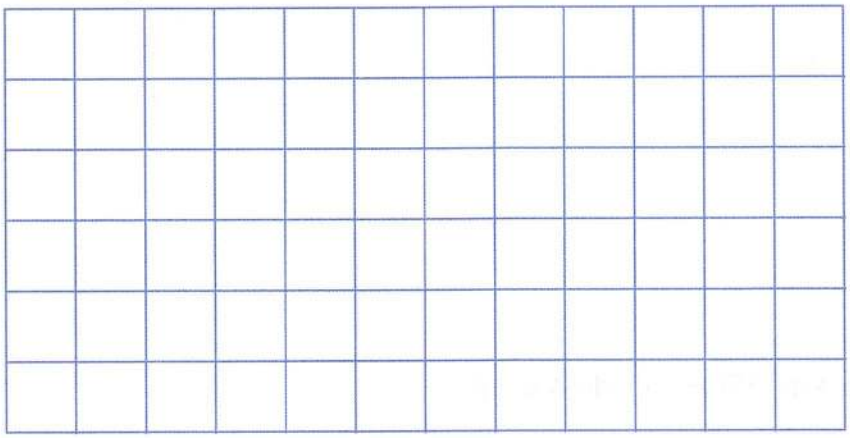
$\angle YWX =$ _____ **[1 mark]**

$\angle WXZ =$ _____ **[3 marks]**

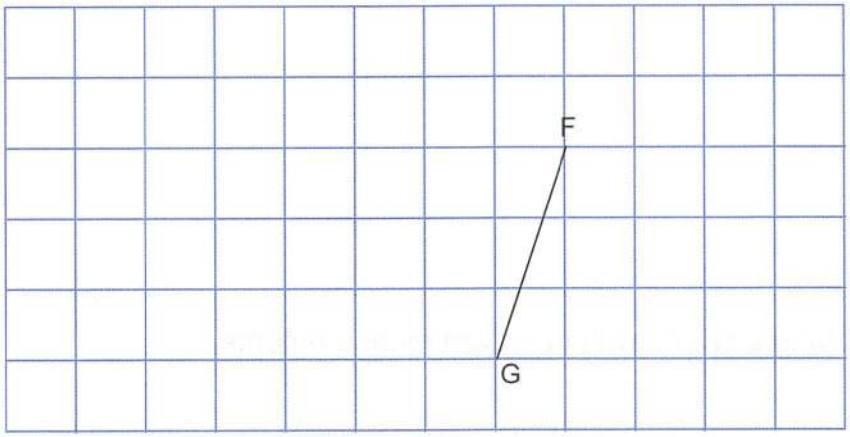
Draw quadrilaterals

(A) Draw each type of triangle in the grid provided. **[6 marks]**

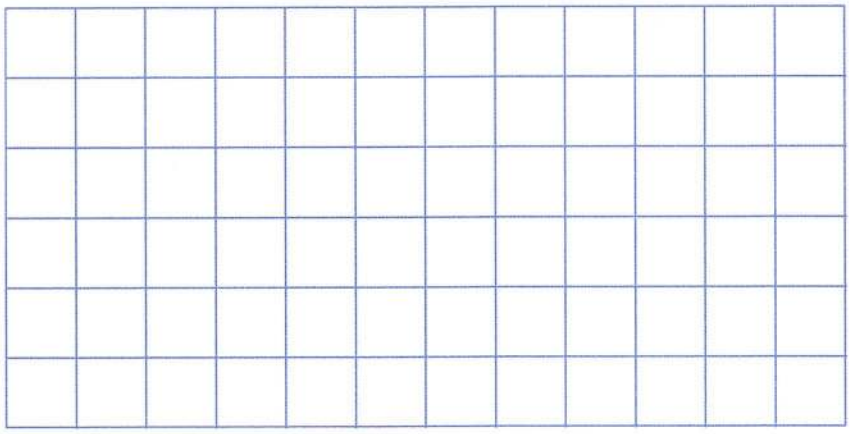
1. Parallelogram ABCD in which AB = 7 units.



2. Rhombus EFGH with the given line FG.



3. Trapezium IJKL in which IJ = 4 units and KL = 8 units.

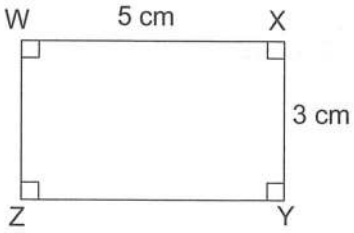


(B) Draw each quadrilateral in the space provided. [10 marks]

1. Draw a parallelogram ABCD in which AB = 5 cm, AC = 3 cm and ABC = 60°.

2. Draw a square OPQR of side 4.5 cm.

3. Draw a rectangle WXYZ with the given measurements.



4. Draw a rhombus EFGH of side 3.5 cm and $\angle EFG = 70^\circ$.

5. Draw a trapezium CDEF in which CD // EF, CE = 6 cm, EF = 7 cm, $\angle CEF = 50^\circ$ and $\angle DFE = 75^\circ$.

Do Review 6 to practise on Triangles and Quadrilaterals.
Go to **My SAPeducation App** or www.sapgrp.com
Test yourself! Do Revision Test 2 on units 9 to 15. Get your answers marked for Revision Test 2 by Geniebook! (See first page of book for instructions.)

NOTES

SAP education

40 CELEBRATING YEARS

LEARNING MATHEMATICS

For Primary Levels

5

Solutions

SOLUTIONS

Unit 1: Whole Numbers

Count and write numbers within 10 million in numerals and words

(A) 1. 10 000, 20 000, 30 000, 40 000
2. 10 000, 20 000, 30 000, 40 000, 50 000
3. 10 000, 20 000, 30 000, 40 000, 50 000, 60 000, 70 000
4. 10 000, 20 000, 30 000, 40 000, 50 000, 60 000, 70 000, 80 000
5. 10 000, 20 000, 30 000, 40 000, 50 000, 60 000, 70 000, 80 000, 90 000

(B) 1. 100 000, 200 000, 300 000, 400 000, 500 000, 600 000
2. 100 000, 200 000, 300 000, 400 000, 500 000, 600 000, 700 000
3. 100 000, 200 000, 300 000, 400 000, 500 000, 600 000, 700 000, 800 000
4. 100 000, 200 000, 300 000, 400 000, 500 000, 600 000, 700 000, 800 000, 900 000
5. 100 000, 200 000, 300 000, 400 000, 500 000, 600 000, 700 000, 800 000, 900 000, 1 000 000

(C) 1. 1 000 000, 2 000 000, 3 000 000, 4 000 000
2. 1 000 000, 2 000 000, 3 000 000, 4 000 000, 5 000 000, 6 000 000
3. 1 000 000, 2 000 000, 3 000 000, 4 000 000, 5 000 000, 6 000 000, 7 000 000
4. 1 000 000, 2 000 000, 3 000 000, 4 000 000, 5 000 000, 6 000 000, 7 000 000, 8 000 000
5. 1 000 000, 2 000 000, 3 000 000, 4 000 000, 5 000 000, 6 000 000, 7 000 000, 8 000 000, 9 000 000, 10 000 000

(D) 1. 3 024 522
2. 4 161 433
3. 2 855 066
4. 5 509 974
5. 8 232 686
6. 7 370 505
7. 1 789 390
8. 6 234 432
9. 9 621 345
10. 3 906 069

(E) 1. four million and three thousand
2. seven million and eight hundred thousand
3. eight hundred and sixty-nine thousand, five hundred and thirty-nine
4. four million, five hundred and two thousand, one hundred and forty-six
5. three hundred and ninety-seven thousand, six hundred and fifty-three
6. two million, one hundred and thirty-six thousand, four hundred and fifty-seven
7. nine million, ninety-one thousand and ninety-one
8. six million, six hundred and forty thousand, eight hundred and sixty-four
9. one million, seven hundred and fifty-eight thousand and two.
10. five million, three hundred and ninety-eight.

(F) 1. 2 706 000
2. 483 000
3. 8 000 314
4. 145 001
5. 6 101 600
6. 3 564 178
7. 9 002 009
8. 5 600 703
9. 7 894 087
10. 4 025 250

(G) 1. **2000**
72 662 = 70 000 + 2000 + 600 + 62
2. **20 000**
23 455 = 20 000 + 3000 + 400 + 50 + 5
3. **100**
40 133 = 40 000 + 100 + 30 + 3
4. **90**
99 099 = 90 000 + 9000 + 90 + 9
5. **50 000**
56 004 = 50 000 + 6000 + 4
6. **700**
551 700 = 550 000 + 1000 + 700
7. **300 000**
369 078 = 300 000 + 60 000 + 9000 + 70 + 8
8. **6000**
606 101 = 600 000 + 6000 + 100 + 1
9. **50 000**
152 050 = 100 000 + 50 000 + 2000 + 50
10. **300**
810 376 = 800 000 + 10 000 + 300 + 70 + 6
11. **1000**
1 000 000 – 999 000 = 1000
12. **850 000**
1 854 000 = 1 000 000 + 850 000 + 4000
13. **4 000 000**
4 600 800 = 4 000 000 + 600 000 + 800
14. **50 000**
2 350 235 = 2 000 000 + 300 000 + 50 000 + 235
15. **654**
6 007 654 = 6 000 000 + 7000 + 654
16. **8000**
9 018 380 = 9 000 000 + 10 000 + 8000 + 380

17. **3 000 000**
3 133 100 = 3 000 000 + 100 000 + 30 000 + 3000 + 100

18. **600 000**
5 675 025 = 5 000 000 + 600 000 + 70 000 + 5000 + 25

19. **4000**
7 804 708 = 7 000 000 + 800 000 + 4000 + 708

20. **8 000 000**
8 416 399 = 8 000 000 + 400 000 + 10 000 + 6000 + 399

Unit 2: Operations of Whole Numbers

Perform multiplication of tens, hundreds, thousands and their multiples

(A) 1. **830**
83 × 10 = 830

2. **1960**
196 × 10 = 1960

3. **60 040**
6004 × 10 = 60 040

4. **1900**
19 × 100 = 1900

5. **57 500**
575 × 100 = 57 500

6. **184 000**
1840 × 100 = 184 000

7. **64 000**
64 × 1000 = 64 000

8. **183 000**
183 × 1000 = 183 000

9. **5 190 000**
5190 × 1000 = 5 190 000

(B) 1. **10**
106 × 10 = 1060

2. **100**
54 × 100 = 5400

3. **10**
97 × 10 = 970

4. **10**
2358 × 10 = 23 580

5. **1000**
32 × 1000 = 32 000

6. **1000**
721 × 1000 = 721 000

7. **100**
489 × 100 = 48 900

8. **100**
6710 × 100 = 671 000

9. **1000**
8494 × 1000 = 8 494 000

10. **3107**
3107 × 10 = 31 070

11. **580**
580 × 100 = 58 000

12. **41**
41 × 1000 = 41 000

13. **255**
255 × 10 = 2550

14. **63**
63 × 100 = 6300

15. **7002**
7002 × 1000 = 7 002 000

16. **76**
76 × 10 = 760

17. **4899**
4899 × 100 = 489 900

18. **924**
924 × 1000 = 924 000

(C) 1. **6**
270
2700

2. **9**
2817
28 170

3. **5**
25 250
252 500

4. **7**
392
39 200

5. **3**
2472
247 200

6. **9**
12 213
1 221 300

7. **7**
42
42 000

8. **8**
136
136 000

9. **2**
1974
1 974 000

Perform division of tens, hundreds, thousands and their multiples

(A) 1. **5**
50 ÷ 10 = 5

2. **41**
410 ÷ 10 = 41

3. **707**
7070 ÷ 10 = 707

4. **2345**
23 450 ÷ 10 = 2345

5. **36 711**
367 110 ÷ 10 = 36 711

6. **688 000**
6 880 000 ÷ 10 = 688 000

7. **6**
600 ÷ 100 = 6

8. **84**
8400 ÷ 100 = 84

9. **159**
15 900 ÷ 100 = 159

10. **7045**
704 500 ÷ 100 = 7045

11. **10 261**
1 026 100 ÷ 100 = 10 261
12. **4**
4000 ÷ 1000 = 4
13. **60**
60 000 ÷ 1000 = 60
14. **985**
985 000 ÷ 1000 = 985
15. **8102**
8 102 000 ÷ 1000 = 8102

(B) 1. **10**
320 ÷ 10 = 32
2. **100**
400 ÷ 100 = 4
3. **1000**
8000 ÷ 1000 = 8
4. **10**
1560 ÷ 10 = 156
5. **1000**
91 000 ÷ 1000 = 91
6. **100**
307 000 ÷ 100 = 3070
7. **10**
61 100 ÷ 10 = 6110
8. **1000**
1 575 000 ÷ 1000 = 1575
9. **100**
2700 ÷ 100 = 27
10. **100**
8 940 000 ÷ 100 = 89 400
11. **10**
482 000 ÷ 10 = 48 200
12. **1000**
526 000 ÷ 1000 = 526
13. **100**
73 500 ÷ 100 = 735
14. **10**
2 122 110 ÷ 10 = 212 211
15. **3000**
3000 ÷ 1000 = 3
16. **900**
900 ÷ 100 = 9
17. **10 100**
10 100 ÷ 10 = 1010
18. **1 800 000**
1 800 000 ÷ 1000 = 1800
19. **767 600**
767 600 ÷ 100 = 7676
20. **700**
700 ÷ 10 = 70
21. **992 000**
992 000 ÷ 1000 = 992
22. **68 600**
68 600 ÷ 100 = 686
23. **4200**
4200 ÷ 10 = 420
24. **24 000**
24 000 ÷ 1000 = 24
25. **5500**
5500 ÷ 100 = 55
26. **830 000**
830 000 ÷ 10 = 83 000
27. **5 005 700**
5 005 700 ÷ 100 = 50 057
28. **3 452 000**
3 452 000 ÷ 10 = 345 200

(C) 1. **10, 5**
95, 5
19
2. **10, 9**
576, 9
64
3. **10, 7**
4242, 7
606
4. **10, 6**
58 638, 6
9773
5. **10, 8**
312 448, 8
39 056
6. **100, 4**
76, 4
19
7. **100, 3**
909, 3
303
8. **100, 5**
8765, 5
1753
9. **100, 7**
41 132, 7
5876
10. **1000, 8**
72, 8
9
11. **1000, 5**
550, 5
110
12. **1000, 9**
6336, 9
704

Perform order of operations

1. **10**
(35 + 15 + 20) ÷ 7 = 70 ÷ 7 = 10
For checking:
C (3 5 + 1 5 + 2 0) ÷ 7 =

2. **28**

$18 \div 3 + 32 - 10 = 6 + 32 - 10$
$= 38 - 10$
$= 28$

For checking:

C 1 8 ÷ 3 + 3 2 − 1 0 =

3. **99**

$36 - 84 \div 12 + 14 \times 5 = 36 - 7 + 70$
$= 29 + 70$
$= 99$

For checking:

C 3 6 − 8 4 ÷ 1 2 + 1 4 × 5 =

4. **1170**

$78 \div (456 - 450) \times 90 = 78 \div 6 \times 90$
$= 13 \times 90$
$= 1170$

For checking:

C 7 8 ÷ (4 5 6 − 4 5 0) × 9 0 =

5. **36**

$8 \times (17 - 9) - 28 = 8 \times 8 - 28$
$= 64 - 28$
$= 36$

For checking:

C 8 × (1 7 − 9) − 2 8 =

6. **787**

$56 \div 8 + 13 \times (88 - 28) = 56 \div 8 + 13 \times 60$
$= 7 + 13 \times 60$
$= 7 + 780$
$= 787$

For checking:

C 5 6 ÷ 8 + 1 3 × (8 8 − 2 8) =

7. **1240**

$600 + (72 - 32) \div 5 \times 80 = 600 + 40 \div 5 \times 80$
$= 600 + 8 \times 80$
$= 600 + 640$
$= 1240$

For checking:

C 6 0 0 + (7 2 − 3 2) ÷ 5 × 8 0 =

8. **70**

$100 \div 20 \times (5 + 9) = 100 \div 20 \times 14$
$= 5 \times 14$
$= 70$

For checking:

C 1 0 0 ÷ 2 0 × (5 + 9) =

9. **46**

$55 \div (13 - 8) - 7 + 21 \times 2 = 55 \div 5 - 7 + 21 \times 2$
$= 11 - 7 + 42$
$= 4 + 42$
$= 46$

For checking:

C 5 5 ÷ (1 3 − 8) − 7 + 2 1 × 2 =

10. **95**

$(18 - 5) \times 7 + (23 - 11) \div 3 = 13 \times 7 + 12 \div 3$
$= 91 + 4$
$= 95$

For checking:

C (1 8 − 5) × 7 + (2 3 − 1 1) ÷ 3 =

11. **360**

$80 \times 15 \div 40 \times 12 = 1200 \div 40 \times 12$
$= 30 \times 12$
$= 360$

For checking:

C 8 0 × 1 5 ÷ 4 0 × 1 2 =

12. **96**

$(144 \div 12) \times (72 \div 9) = 12 \times 8 = 96$

For checking:

C (1 4 4 ÷ 1 2) × (7 2 ÷ 9) =

13. **30**

$48 \times 50 \div 10 \div 8 = 48 \times 5 \div 8 = 240 \div 8 = 30$

For checking:

C 4 8 × 5 0 ÷ 1 0 ÷ 8 =

14. **100**

$145 - 34 - (23 - 12) = 145 - 34 - 11 = 100$

For checking:

C 1 4 5 − 3 4 − (2 3 − 1 2) =

15. **76**

$(145 - 34) - 23 - 12 = 111 - 23 - 12 = 76$

For checking:

C (1 4 5 − 3 4) − 2 3 − 1 2 =

16. **122**

$145 - (34 - 23) - 12 = 145 - 11 - 12 = 122$

For checking:

C 1 4 5 − (3 4 − 2 3) − 1 2

17. **140**

$(25 + 45) \times (28 + 32) \div (14 + 16) = 70 \times 60 \div 30$
$= 4200 \div 30$
$= 140$

For checking:

C (2 5 + 4 5) × (2 8 + 3 2) ÷ (1 4 + 1 6) =

18. **5600**

$(220 + 130) \div (29 + 21) \times (525 + 275) = 350 \div 50 \times 800$
$= 7 \times 800$
$= 5600$

For checking:

C (2 2 0 + 1 3 0) ÷ (2 9 + 2 1) × (5 2 5 + 2 7 5) =

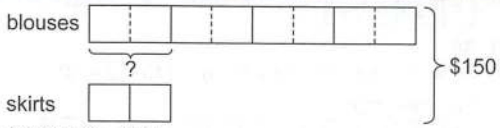
19. **3**
$(30 \times 20 + 120) \div (350 - 11 \times 10)$
$= (600 + 120) \div (350 - 110)$
$= 720 \div 240$
$= 3$
For checking:

C	(	3	0	×	2	0	+	1	2	0	)	÷
(	3	5	0	–	1	1	×	1	0	)	=	

20. **22**
$(810 \div 90 - 7) \times (6 + 250 \div 50) = (9 - 7) \times (6 + 5)$
$= 2 \times 11$
$= 22$
For checking:

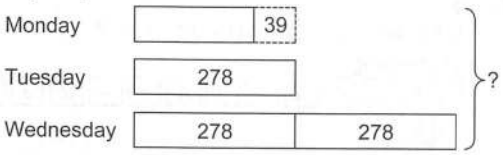
C	(	8	1	0	÷	9	0	–	7	)	×	(
6	+	2	5	0	÷	5	0	)	=			

Solve word problems related to whole numbers

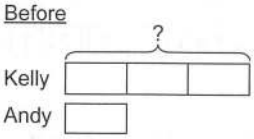
1. 

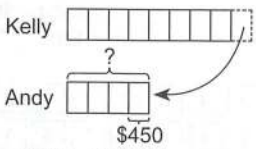
$150 \div 10 = \$15$
$2 \times \$15 = \$30$
The cost of each blouse was $30.

2. $7 + $5 = $12
$30 \times \$12 = \$360$
He would have to pay **$360** to buy all the books at the original price.

3. 

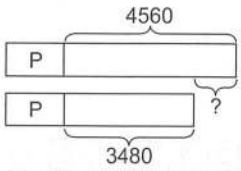
$(278 - 39) + 278 + (2 \times 278) = 239 + 278 + 556 = 1073$
The baker sold **1073** pies altogether on the three days.

4. Before


After


(a) $4 \times \$450 = \$1800$
Andy had **$1800** in the end.
(b) $9 \times \$450 = \$4050$
Kelly had **$4050** at first.

5. $\$264 - (3 \times \$22) - (5 \times \$18) = \$108$
$\$108 \div \$9 = 12$
She bought **12 kg** of squids.

6. 

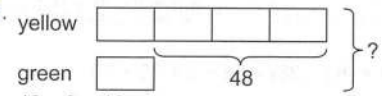
24 – 18 = 6 tins of canned food
4560 – 3480 = 1080 g
The mass of 6 tins of canned food is 1080 g.
3480 – (3 × 1080) = 240 g
The mass of the pail is **240 g.**

7. $(24 \times \$275) + \$399 = \$6999$
The leather sofa was **$6999**.

8. $783 \div 9 = 87$
$9 - 4 = 5$
$5 \times 87 = 435$
She had 435 strawberries left.
$435 \div 5 = 87$
She had **87** packs of strawberries in the end.

9. $\$280 \div \$5 = 56$
$56 \times 10 = 560$
$560 \div 28 = 20$
20 cartons of instant noodles were sold.

10. $7 \times 25 = 175$
$9 \times 100 = 900$
$(175 \times \$19) + (900 \times \$2) = \$5125$
He paid **$5125** in all.

11. 

$48 \div 3 = 16$
$5 \times 16 = 80$
There are **80** marbles altogether in the box.

12. (7×4) kiwis + 8 plums = 28 kiwis + 8 plums
$(7 \times \$5) + \$2 = \$37$
$\$2516 \div \$37 = 68$
$68 \times (28 \text{ kiwis} + 8 \text{ plums}) = 1904 \text{ kiwis} + 544 \text{ plums}$
$= 2448$
She sold **2448** fruit in all.

13. $5 \times \$2079 = \$10\,395$
$\$10\,395 \div 15 = \$693$
He paid **$693** for each installment.

14. $680\,000 \div 200 = 3400$
The mass of each bag of flour is 3400 g.
$100 \times 3400 = 340\,000$
$340\,000 \div 5000 = 68$
He had **68** bags of flour in the end.

Review 1 (Questions available online.)

1. **(2)**
2. **(3)**
$70 \times 190 = 13\,300$
$700 \times 19 = 13\,300$
$190 \times 7 \times 10 = 13\,300$
$10 \times 70 \times 90 = 63\,000$
$7 \times 19 \times 100 = 13\,300$
3. **(2)**
4. **(1)**
Press

C	3	6	+	6	÷	3	×	4	–	1
1	=									

5. **(2)**
6 129 374 = 6 000 000 + 100 000 + 20 000 + 9000 + 374

6. **(3)**
368 400 ÷ 400 = 368 400 ÷ 100 ÷ 4 = 3684 ÷ 4 = 921

7. **(2)**
2234 + 7586 = 9820
9820 – 1680 = 8140
8140 ÷ 44 = 185

8. **six million, one hundred thousand and forty-nine**

9. **4 114 041**

10. **56 000**
5 056 605 = 5 000 000 + 56 000 + 600 + 5

11. **6**
(8 – 7 + 6) – (2 + 3 – 4) = (1 + 6) – (5 – 4) = 7 – 1 = 6

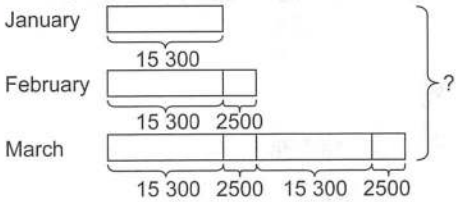
12. **213**
Press [C] [3] [1] [×] [(] [6] [+] [8] [)] [÷] [2] [–] [6] [0] [÷] [1] [5] [=]

13. **727 800**
1213 × 600 = 1213 × 6 × 100 = 7278 × 100 = 727 800

14. **1317**
658 500 ÷ 500 = 658 500 ÷ 100 ÷ 5 = 6585 ÷ 5 = 1317

15. **191**
76 400 ÷ 400 = 76 400 ÷ 100 ÷ 4 = 764 ÷ 4 = 191

16. 2 × 12 × $315 = $7560
$7560 + $520 = $8080
It cost **$8080** to install the cabinets.

17. 

(4 × 15 300) + (3 × 2500) = 68 700
The total number of T-shirts that the factory had produced in these three months was **68 700**.

18. Use 'Guess and Check' method.

Guess	No. of cows	No. of chickens	Total number of legs	Comments
1	25	25	(25 × 4) + (25 × 2) = 150	Too high
2	20	30	(20 × 4) + (30 × 2) = 140	Too high
3	15	35	(15 × 4) + (35 × 2) = 130	Very Near
4	12	38	(12 × 4) + (38 × 2) = 124	Correct

38 – 12 = 26
There are **26** more chickens than cows.

19. 625 – 79 = 546
546 ÷ 2 = 273
There were 273 goldfish at first.
273 + 79 = 352
There were 352 guppies at first.
273 ÷ 21 = 13
21 – 10 = 11
11 × 13 = 143
There were 143 goldfish left in the end.
352 – 143 = 209
209 more guppies than goldfish were left.

20. $960 ÷ $10 = 96
96 × 3 = 288
288 ÷ 32 = 9
There were **9** greeting cards in each box.

Unit 3: Fractions and Mixed Numbers

Make a connection between fractions and division

(A) 1. $\frac{2}{7}$
$4 \div 14 = \frac{4}{14} = \frac{2}{7}$

2. $\frac{1}{15}$
$5 \div 75 = \frac{5}{75} = \frac{1}{15}$

3. $\frac{3}{13}$
$9 \div 39 = \frac{9}{39} = \frac{3}{13}$

4. $\frac{3}{16}$
$12 \div 64 = \frac{12}{64} = \frac{3}{16}$

5. $\frac{1}{9}$
$13 \div 117 = \frac{13}{117} = \frac{1}{9}$

6. $1\frac{1}{2}$
$12 \div 8 = \frac{12}{8} = \frac{3}{2} = 1\frac{1}{2}$

7. $5\frac{4}{5}$
$29 \div 5 = \frac{29}{5} = 5\frac{4}{5}$

8. $5\frac{1}{7}$
$36 \div 7 = \frac{36}{7} = 5\frac{1}{7}$

9. $10\frac{1}{2}$
$42 \div 4 = \frac{42}{4} = \frac{21}{2} = 10\frac{1}{2}$

10. $13\frac{2}{3}$
$82 \div 6 = \frac{82}{6} = \frac{41}{3} = 13\frac{2}{3}$

(B) 1. $\frac{3}{10} = \mathbf{3 \div 10}$

2. $\frac{6}{7} = \mathbf{6 \div 7}$

3. $\frac{8}{9} = \mathbf{8 \div 9}$

4. $\frac{11}{12} = \mathbf{11 \div 12}$

5. $\frac{15}{101} = \mathbf{15 \div 101}$

6. $2\frac{4}{5} = \frac{14}{5} = \mathbf{14 \div 5}$

7. $4\frac{5}{6} = \frac{29}{6} = \mathbf{29 \div 6}$

8. $7\frac{7}{8} = \frac{63}{8} = \mathbf{63 \div 8}$

9. $10\frac{1}{10} = \frac{101}{10} = \mathbf{101 \div 10}$

10. $11\frac{11}{13} = \frac{154}{13} = \mathbf{154 \div 13}$

Convert fractions to decimals

1. **0.25** $\frac{5}{20} = \frac{25}{100} = 0.25$

2. **0.24** $\frac{6}{25} = \frac{24}{100} = 0.24$

3. **0.57**

$\frac{4}{7} = 4 \div 7$

≈ 0.57

$$\begin{array}{r} 0.571 \\ 7\overline{)4.0} \\ 35 \\ \hline 50 \\ 49 \\ \hline 10 \\ 7 \\ \hline 3 \end{array}$$

4. **6.22**

$\frac{2}{9} = 2 \div 9$

≈ 0.22

$6\frac{2}{9} \approx 6 + 0.22$

$= 6.22$

$$\begin{array}{r} 0.222 \\ 9\overline{)2.0} \\ 18 \\ \hline 20 \\ 18 \\ \hline 20 \\ 18 \\ \hline 2 \end{array}$$

5. **7.23**

$\frac{3}{13} = 3 \div 13$

≈ 0.23

$7\frac{3}{13} \approx 7 + 0.23$

$= 7.23$

$$\begin{array}{r} 0.230 \\ 13\overline{)3.0} \\ 26 \\ \hline 40 \\ 39 \\ \hline 10 \end{array}$$

6. **0.38**

$\frac{3}{8} = 3 \div 8$

Press [C] [3] [÷] [8] [=]

$\frac{3}{8} = 0.375 \approx 0.38$

7. **0.82**

$\frac{9}{11} = 9 \div 11$

Press [C] [9] [÷] [1] [1] [=]

$\frac{9}{11} = 0.8181... \approx 0.82$

8. **13.33**

$\frac{1}{3} = 1 \div 3$

Press [C] [1] [÷] [3] [=]

$\frac{1}{3} = 0.3333... \approx 0.33$

$13\frac{1}{3} \approx 13 + 0.33 \approx 13.33$

9. **5.36**

$\frac{5}{14} = 5 \div 14$

Press [C] [5] [÷] [1] [4] [=]

$\frac{5}{14} = 0.357... \approx 0.36$

$5\frac{5}{14} \approx 5 + 0.36$

$= 5.36$

10. **2.92**

$\frac{11}{12} = 11 \div 12$

Press [C] [1] [1] [÷] [1] [2] [=]

$\frac{11}{12} = 0.916... \approx 0.92$

$2\frac{11}{12} \approx 2 + 0.92 = 2.92$

Add and subtract mixed numbers

(A) 1. **$4\frac{5}{24}$**

$2\frac{7}{8} + 1\frac{1}{3} = 2\frac{21}{24} + 1\frac{8}{24}$

$= 3\frac{29}{24}$

$= 4\frac{5}{24}$

2. **$6\frac{7}{36}$**

$4\frac{4}{9} + 1\frac{3}{4} = 4\frac{16}{36} + 1\frac{27}{36}$

$= 5\frac{43}{36}$

$= 6\frac{7}{36}$

3. **$13\frac{24}{35}$**

$10\frac{2}{5} + 3\frac{2}{7} = 10\frac{14}{35} + 3\frac{10}{35}$

$= 13\frac{24}{35}$

4. **$6\frac{1}{6}$**

$2\frac{1}{2} + 3\frac{2}{3} = 2\frac{3}{6} + 3\frac{4}{6}$

$= 5\frac{7}{6}$

$= 6\frac{1}{6}$

5. **$10\frac{5}{12}$**

$4\frac{1}{4} + 6\frac{1}{6} = 4\frac{3}{12} + 6\frac{2}{12}$

$= 10\frac{5}{12}$

6. **$8\frac{13}{18}$**

$3\frac{1}{6} + 5\frac{5}{9} = 3\frac{6}{36} + 5\frac{20}{36}$

$= 8\frac{26}{36}$

$= 8\frac{13}{18}$

Press [C] [3] [$a\frac{b}{c}$] [1] [$a\frac{b}{c}$] [6] [+] [5] [$a\frac{b}{c}$] [5] [$a\frac{b}{c}$] [9] [=]

7. $8\frac{7}{15}$

$3\frac{2}{3} + 4\frac{4}{5} = 3\frac{10}{15} + 4\frac{12}{15}$

$= 7\frac{22}{15}$

$= 8\frac{7}{15}$

Press [C] [3] [$a\frac{b}{c}$] [2] [$a\frac{b}{c}$] [3] [+] [4] [$a\frac{b}{c}$] [4] [$a\frac{b}{c}$] [5] [=]

8. $12\frac{3}{28}$

$9\frac{6}{7} + 2\frac{1}{4} = 9\frac{24}{28} + 2\frac{7}{28}$

$= 11\frac{31}{28}$

$= 12\frac{3}{28}$

Press [C] [9] [$a\frac{b}{c}$] [6] [$a\frac{b}{c}$] [7] [+] [2] [$a\frac{b}{c}$] [1] [$a\frac{b}{c}$] [4] [=]

9. $16\frac{27}{40}$

$7\frac{7}{8} + 8\frac{4}{5} = 7\frac{35}{40} + 8\frac{32}{40}$

$= 15\frac{67}{40}$

$= 16\frac{27}{40}$

Press [C] [7] [$a\frac{b}{c}$] [7] [$a\frac{b}{c}$] [8] [+] [8] [$a\frac{b}{c}$] [4] [$a\frac{b}{c}$] [5] [=]

10. $13\frac{11}{60}$

$6\frac{3}{5} + 6\frac{7}{12} = 6\frac{36}{60} + 6\frac{35}{60}$

$= 12\frac{71}{60}$

$= 13\frac{11}{60}$

Press [C] [6] [$a\frac{b}{c}$] [3] [$a\frac{b}{c}$] [5] [+] [6] [$a\frac{b}{c}$] [7] [$a\frac{b}{c}$] [1] [2] [=]

(B) 1. $4\frac{3}{10}$

$5\frac{3}{5} - 1\frac{3}{10} = 5\frac{6}{10} - 1\frac{3}{10}$

$= 4\frac{3}{10}$

2. $2\frac{7}{30}$

$4\frac{9}{10} - 2\frac{2}{3} = 4\frac{27}{30} - 2\frac{20}{30}$

$= 2\frac{7}{30}$

3. $7\frac{7}{8}$

$12\frac{5}{8} - 4\frac{3}{4} = 12\frac{5}{8} - 4\frac{6}{8}$

$= 11\frac{13}{8} - 4\frac{6}{8}$

$= 7\frac{7}{8}$

4. $2\frac{1}{3}$

$3\frac{1}{2} - 1\frac{1}{6} = 3\frac{3}{6} - 1\frac{1}{6}$

$= 2\frac{2}{6}$

$= 2\frac{1}{3}$

5. $2\frac{11}{12}$

$8\frac{3}{4} - 5\frac{5}{6} = 8\frac{9}{12} - 5\frac{10}{12}$

$= 7\frac{21}{12} - 5\frac{10}{12}$

$= 2\frac{11}{12}$

6. $2\frac{17}{22}$

$6\frac{3}{11} - 3\frac{1}{2} = 6\frac{6}{22} - 3\frac{11}{22}$

$= 5\frac{28}{22} - 3\frac{11}{22}$

$= 2\frac{17}{22}$

Press [C] [6] [$a\frac{b}{c}$] [3] [$a\frac{b}{c}$] [1] [1] [−] [3] [$a\frac{b}{c}$] [1] [$a\frac{b}{c}$] [2] [=]

7. $1\frac{1}{20}$

$2\frac{4}{5} - 1\frac{3}{4} = 2\frac{16}{20} - 1\frac{15}{20}$

$= 1\frac{1}{20}$

Press [C] [2] [$a\frac{b}{c}$] [4] [$a\frac{b}{c}$] [5] [−] [1] [$a\frac{b}{c}$] [3] [$a\frac{b}{c}$] [4] [=]

8. $\frac{17}{21}$

$4\frac{1}{7} - 3\frac{1}{3} = 4\frac{3}{21} - 3\frac{7}{21}$

$= 3\frac{24}{21} - 3\frac{7}{21}$

$= \frac{17}{21}$

Press [C] [4] [$a\frac{b}{c}$] [1] [$a\frac{b}{c}$] [7] [−] [3] [$a\frac{b}{c}$] [1] [$a\frac{b}{c}$] [3] [=]

9. $3\frac{34}{35}$

$10\frac{2}{5} - 6\frac{3}{7} = 10\frac{14}{35} - 6\frac{15}{35}$

$= 9\frac{49}{35} - 6\frac{15}{35}$

$= 3\frac{34}{35}$

Press [C] [1] [0] [$a\frac{b}{c}$] [2] [$a\frac{b}{c}$] [5] [−] [6] [$a\frac{b}{c}$] [3] [$a\frac{b}{c}$] [7] [=]

10. $6\frac{41}{45}$

$9\frac{4}{5} - 2\frac{8}{9} = 9\frac{36}{45} - 2\frac{40}{45} = 8\frac{81}{45} - 2\frac{40}{45} = 6\frac{41}{45}$

Press [C] [9] [$a\frac{b}{c}$] [4] [$a\frac{b}{c}$] [5] [−] [2] [$a\frac{b}{c}$] [8] [$a\frac{b}{c}$] [9] [=]

Unit 4: Multiplying Whole Numbers, Fractions and Mixed Numbers

Find the product of fractions and whole numbers

1. **12**
$\frac{1}{5} \times 60 = \frac{1 \times 60}{5} = \frac{60}{5} = 12$

2. **16**
$\frac{2}{3} \times 24 = \frac{2 \times 24}{3} = \frac{48}{3} = 16$

3. **24**
$\frac{4}{7} \times 42 = \frac{4 \times 42}{7} = \frac{168}{7} = 24$

4. **30**
$\frac{5}{9} \times 54 = \frac{5 \times 54}{9} = \frac{270}{9} = 30$

5. **30**
$\frac{10}{11} \times 33 = \frac{330}{11} = 30$

6. **42**
$\frac{3}{\cancel{2}_{1}} \times \overset{14}{\cancel{28}} = 3 \times 14 = 42$

7. **20**
$\frac{5}{\cancel{4}_{1}} \times \overset{4}{\cancel{16}} = 5 \times 4 = 20$

8. **117**
$\frac{9}{\cancel{9}_{1}} \times \overset{13}{\cancel{65}} = 9 \times 13 = 117$

9. **91**
$\frac{13}{\cancel{10}_{1}} \times \overset{7}{\cancel{70}} = 13 \times 7 = 91$

10. **96**
$\frac{12}{\cancel{11}_{1}} \times \overset{8}{\cancel{88}} = 12 \times 8 = 96$

Find the product of proper fractions

1. $\frac{1}{6}$
$\frac{4}{9} \times \frac{3}{8} = \frac{4 \times 3}{9 \times 8} = \frac{12}{72} = \frac{1}{6}$

2. $\frac{5}{21}$
$\frac{5}{12} \times \frac{4}{7} = \frac{5 \times 4}{12 \times 7} = \frac{20}{84} = \frac{5}{21}$

3. $\frac{6}{25}$
$\frac{2}{5} \times \frac{6}{10} = \frac{2 \times 6}{5 \times 10} = \frac{12}{50} = \frac{6}{25}$

4. $\frac{11}{36}$
$\frac{11}{12} \times \frac{3}{9} = \frac{11 \times 3}{12 \times 9} = \frac{33}{108} = \frac{11}{36}$

5. $\frac{2}{3}$
$\frac{8}{9} \times \frac{3}{4} = \frac{8 \times 3}{9 \times 4} = \frac{24}{36} = \frac{2}{3}$

6. $\frac{4}{15}$
$\frac{2}{5} \times \frac{2}{3} = \frac{4}{15}$

7. $\frac{1}{4}$
$\frac{\cancel{8}^{1}}{\cancel{8}_{2}} \times \frac{\cancel{3}^{1}}{\cancel{10}_{2}} = \frac{1}{4}$

8. $\frac{2}{15}$
$\frac{\cancel{7}^{1}}{\cancel{10}_{5}} \times \frac{\cancel{4}^{2}}{\cancel{21}_{3}} = \frac{2}{15}$

9. $\frac{2}{5}$
$\frac{\cancel{8}^{1}}{\cancel{7}_{1}} \times \frac{\cancel{14}^{2}}{\cancel{25}_{5}} = \frac{2}{5}$

10. $\frac{6}{25}$
$\frac{\cancel{8}^{2}}{\cancel{15}_{5}} \times \frac{\cancel{9}^{3}}{\cancel{20}_{5}} = \frac{6}{25}$

Find the product of proper and improper fractions

1. $1\frac{1}{35}$
$\frac{4}{7} \times \frac{9}{5} = \frac{36}{35} = 1\frac{1}{35}$

2. **1**
$\frac{\cancel{18}^{2}}{\cancel{4}_{2}} \times \frac{\cancel{2}^{1}}{\cancel{9}_{1}} = \frac{2}{2} = 1$

3. $\frac{7}{24}$
$\frac{7}{3} \times \frac{1}{8} = \frac{7}{24}$

4. **2**
$\frac{\cancel{8}^{1}}{\cancel{8}_{1}} \times \frac{\cancel{12}^{2}}{\cancel{8}_{1}} = 2$

5. $\frac{2}{3}$
$\frac{\cancel{16}^{2}}{\cancel{9}_{3}} \times \frac{\cancel{3}^{1}}{\cancel{8}_{1}} = \frac{2}{3}$

6. $3\frac{2}{11}$
Press [C] [1] [0] [a^b_c] [1] [1] [×] [2] [1] [a^b_c] [6] [=]

7. $2\frac{13}{16}$
Press [C] [3] [a^b_c] [8] [×] [1] [5] [a^b_c] [2] [=]

8. $3\frac{5}{6}$
Press [C] [2] [3] [a^b_c] [5] [×] [1] [0] [a^b_c] [1] [2] [=]

9. $1\frac{3}{7}$
Press [C] [2] [5] [a^b_c] [9] [×] [1] [8] [a^b_c] [3] [5] [=]

10. $1\frac{2}{7}$
Press [C] [3] [0] [a^b_c] [6] [3] [×] [2] [7] [a^b_c] [1] [0] [=]

Find the product of improper fractions

1. $3\frac{1}{4}$

$\frac{13}{\cancel{10}_{1}} \times \frac{\cancel{20}^{2}}{8} = \frac{26}{8} = \frac{13}{4} = 3\frac{1}{4}$

2. **14**

$\frac{\cancel{2}^{1}\cancel{10}}{\cancel{1}\cancel{3}} \times \frac{\cancel{21}^{7}}{\cancel{5}_{1}} = 14$

3. $9\frac{3}{4}$

$\frac{\cancel{3}^{3}\cancel{9}}{2} \times \frac{13}{\cancel{6}_{2}} = \frac{39}{4} = 9\frac{3}{4}$

4. $7\frac{1}{2}$

$\frac{\cancel{5}^{5}\cancel{10}}{\cancel{1}\cancel{7}} \times \frac{\cancel{21}^{3}}{\cancel{4}_{2}} = \frac{15}{2} = 7\frac{1}{2}$

5. $2\frac{2}{3}$

$\frac{\cancel{4}^{4}\cancel{24}}{\cancel{1}\cancel{5}} \times \frac{\cancel{30}^{\cancel{2}}}{\cancel{18}_{3}} = \frac{8}{3} = 2\frac{2}{3}$

6. $23\frac{1}{3}$

Press [C] [4] [9] [a b/c] [9] [×] [3] [0] [a b/c] [7] [=]

7. $3\frac{43}{44}$

Press [C] [1] [5] [a b/c] [1] [1] [×] [3] [5] [a b/c] [1] [2] [=]

8. $24\frac{9}{56}$

Press [C] [3] [3] [a b/c] [8] [×] [4] [1] [a b/c] [7] [=]

9. $5\frac{53}{54}$

Press [C] [1] [7] [a b/c] [6] [×] [1] [9] [a b/c] [9] [=]

10. $5\frac{1}{8}$

Press [C] [4] [1] [a b/c] [1] [4] [×] [2] [1] [a b/c] [1] [2] [=]

Find the product of mixed numbers and whole numbers

1. **104**

$2\frac{3}{5} \times 40 = \frac{13}{\cancel{5}_{1}} \times \frac{\cancel{40}^{8}}{1} = 13 \times 8 = 104$

2. $110\frac{1}{4}$

$6\frac{1}{8} \times 18 = \frac{49}{\cancel{8}_{4}} \times \frac{\cancel{18}^{9}}{1} = \frac{49 \times 9}{4} = \frac{441}{4} = 110\frac{1}{4}$

3. $53\frac{1}{3}$

$16 \times 3\frac{1}{3} = 16 \times \frac{10}{3} = \frac{16 \times 10}{3} = \frac{160}{3} = 53\frac{1}{3}$

4. **95**

$20 \times 4\frac{3}{4} = \frac{\cancel{20}^{5}}{1} \times \frac{19}{\cancel{4}_{1}} = 5 \times 19 = 95$

5. $194\frac{4}{9}$

$5\frac{5}{9} \times 35 = \frac{50}{9} \times 35 = \frac{1750}{9} = 194\frac{4}{9}$

6. **464**

Press [C] [8] [a b/c] [2] [a b/c] [7] [×] [5] [6] [=]

7. **558**

Press [C] [9] [9] [×] [5] [a b/c] [7] [a b/c] [1] [1] [=]

8. $357\frac{2}{3}$

Press [C] [7] [4] [×] [4] [a b/c] [5] [a b/c] [6] [=]

9. $569\frac{3}{5}$

Press [C] [8] [a b/c] [9] [a b/c] [1] [0] [×] [6] [4] [=]

10. $470\frac{1}{3}$

Press [C] [8] [5] [×] [5] [a b/c] [8] [a b/c] [1] [5] [=]

Unit 5: Word Problems on Fractions

Solve word problems related to fractions

1.

$3\frac{2}{5} + 2\frac{1}{2} = 3\frac{4}{10} + 2\frac{5}{10} = 5\frac{9}{10}$

His house is $5\frac{9}{10}$ km away from the library.

2. $3\frac{1}{2} - 1\frac{1}{8} = 3\frac{4}{8} - 1\frac{1}{8}$

$= 2\frac{3}{8}$

$2\frac{3}{8}$ *l* of fruit juice is left.

3. $3\frac{4}{9} - 1\frac{3}{5} = 3\frac{20}{45} - 1\frac{27}{45}$

$= 2\frac{65}{45} - 1\frac{27}{45}$

$= 1\frac{38}{45}$

Bruce's rope was $1\frac{38}{45}$ m.

$3\frac{4}{9} + 1\frac{38}{45} = 3\frac{20}{45} + 1\frac{38}{45}$

$= 4\frac{58}{45}$

$= 5\frac{13}{45}$

The total length of the rope bought by both of them was $5\frac{13}{45}$ m.

4. $1\frac{1}{4} + 1\frac{5}{6} = 1\frac{3}{12} + 1\frac{10}{12}$

$= 2\frac{13}{12}$

$= 3\frac{1}{12}$

Clara took $3\frac{1}{12}$ hours to finish her English homework.

$1\frac{1}{4} + 3\frac{1}{12} = 1\frac{3}{12} + 3\frac{1}{12}$

$= 4\frac{4}{12}$

$= 4\frac{1}{3}$

Clara took $4\frac{1}{3}$ hours to finish all her homework.

5. $3\frac{3}{4} - 1\frac{7}{8} = 3\frac{6}{8} - 1\frac{7}{8}$

$= 2\frac{14}{8} - 1\frac{7}{8}$

$= 1\frac{7}{8}$

The mass of the papaya is $1\frac{7}{8}$ kg.

$3\frac{3}{4} + 1\frac{7}{8} = 3\frac{6}{8} + 1\frac{7}{8} = 4\frac{13}{8} = 5\frac{5}{8}$

The mass of the watermelon and the papaya is $5\frac{5}{8}$ kg.

$6\frac{1}{2} - 5\frac{5}{8} = 6\frac{4}{8} - 5\frac{5}{8}$

$= 5\frac{12}{8} - 5\frac{5}{8}$

$= \frac{7}{8}$

The mass of the honeydew is $\mathbf{\frac{7}{8}}$ **kg**.

6. $\mathbf{5 - 3\frac{3}{4} = 4\frac{4}{4} - 3\frac{3}{4} = 1\frac{1}{4}}$

His sisters ate $1\frac{1}{4}$ pizzas.

$1\frac{1}{4} - \frac{7}{8} = 1\frac{2}{8} - \frac{7}{8}$

$= \frac{10}{8} - \frac{7}{8}$

$= \frac{3}{8}$

Terry ate $\frac{3}{8}$ pizza.

$1\frac{1}{4} + \frac{3}{8} = 1\frac{2}{8} + \frac{3}{8} = 1\frac{5}{8}$

$\mathbf{1\frac{5}{8}}$ pizzas were eaten in all.

7. $9 \div 4 = 2\frac{1}{4}$

$$4\overline{)9}\ \begin{matrix}2\\ 8\\ \hline 1\end{matrix}$$

Her neighbour received $\mathbf{2\frac{1}{4}}$ **litres** of syrup.

8. $30 \div 4 = 7\frac{2}{4} = 7\frac{1}{2}$

$$4\overline{)30}\ \begin{matrix}7\\ 28\\ \hline 2\end{matrix}$$

$\mathbf{7\frac{1}{2}}$ **days** should be spent on each activity.

9. $2\frac{5}{6} + 4\frac{1}{6} = 6\frac{6}{6}$

$= 7$

The two sacks of rice weigh 7 kg in total.

$7 \div 5 = \frac{7}{5} = 1\frac{2}{5}$

$$5\overline{)7}\ \begin{matrix}1\\ 5\\ \hline 2\end{matrix}$$

Each bag of rice weighs $1\frac{2}{5}$ kg.

10. $21 \div 5 = \frac{21}{5} = 4\frac{1}{5}$

$$5\overline{)21}\ \begin{matrix}4\\ 20\\ \hline 1\end{matrix}$$

Each runner covers $\mathbf{4\frac{1}{5}}$ **km**.

11. (a) $\frac{2}{\cancel{5}_1} \times \cancel{15}^{3} = 6$

$15 + 6 = 21$ kg

The total mass of the bags of hazelnuts and cashew nuts is **21 kg**.

(b) $21 \div 8 = \frac{21}{8} = 2\frac{5}{8}$ kg

The mass of each bag of mixed nuts is $\mathbf{2\frac{5}{8}}$ **kg**.

12. $\frac{2}{9} \times \$4815 = \$1070$

He saves \$1070.

$\$4815 - \$1070 = \$3745$

$\frac{1}{2} \times \$3745 = \$1872.50$

He spends **\$1872.50** on food.

13. $1 - \frac{3}{8} = \frac{5}{8}$

$\frac{5}{8}$ of Eugene's money is \$40 more than $\frac{5}{8}$ of Tammy's money.

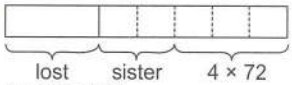
$\frac{5}{8} \rightarrow \$40$

$\frac{1}{8} \rightarrow \$40 \div 5 = \$8$

$\frac{8}{8} \rightarrow 8 \times \$8 = \$64$

Eugene had **\$64** more than Tammy at first.

14.



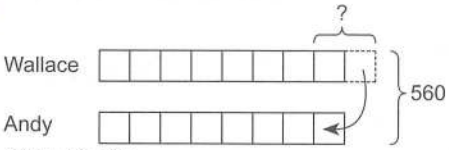
$4 \times 72 = 288$

$(288 \div 3) \times 5 = 480$

$(480 \div 2) \times 3 = 720$

She had **720** marbles at first.

15.



$560 \div 16 = 35$

$2 \times 35 = 70$

Wallace had **70** more trading cards than Andy at first.

16. $\frac{7}{12} \times 108 = 63$ m

The breadth of field A is 63 m.

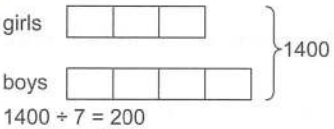
$(2 \times 63) + (2 \times 108) = 342$ m

The perimeter of field A is 342 m.

$\frac{5}{6} \times 342 = 285$ m

The perimeter of field B is **285 m**.

17.



$1400 \div 7 = 200$

$3 \times 200 = 600$

There are 600 girls in the school.

$1400 - 600 = 800$

There are 800 boys in the school.

$1 - \frac{1}{6} = \frac{5}{6}$

$\frac{5}{6} \times 600 = 500$

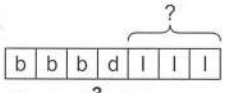
$1 - \frac{1}{5} = \frac{4}{5}$

$\frac{4}{5} \times 800 = 640$

$500 + 640 = 1140$

1140 students are in other levels if $\frac{1}{6}$ of the girls and $\frac{1}{5}$ of the boys are in Primary One.

18.



b: brother
d: drank
l: left

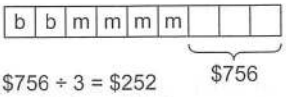
She had $\frac{3}{7}$ of the orange juice left.

19. $\frac{5}{12} \times \$840 = \$350$

$\frac{7}{10} \times \$350 = \$245$

$\$245 \div 4 = \$61.25$

Each dress cost **$61.25.**

20. 

b: books
m: mother

$\$756 \div 3 = \$252$

$9 \times \$252 = \$2268$

$\frac{3}{8} \rightarrow \$2268$

$\frac{1}{8} \rightarrow \$2268 \div 3 = \$756$

$\frac{8}{8} \rightarrow 8 \times \$756 = \$6048$

She had **$6048** in her savings account at first.

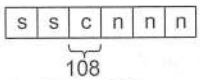
21. (a) $32 \times 45\frac{3}{4} = 1464$ g

The total mass of all 32 packs of red beans was **1464 g**.

(b) $1 - \frac{1}{3} = \frac{2}{3}$

$\frac{2}{3} \times 1464 = 976$ g

She had **976 g** of red beans left.

22. 

s: strawberry
c: coffee
n: nuts

$6 \times 108 = 648$

There were 648 chocolates with strawberry filling, with coffee filling and with nuts.

$\frac{4}{7} \rightarrow 648$

$\frac{1}{7} \rightarrow 648 \div 4 = 162$

$\frac{3}{7} \rightarrow 3 \times 162 = 486$

There were **486** plain chocolates.

Review 2 (Questions available online.)

1. **(1)**

$5\frac{1}{4} - 2\frac{7}{8} = 5\frac{2}{8} - 2\frac{7}{8} = 4\frac{10}{8} - 2\frac{7}{8} = 2\frac{3}{8}$

2. **(2)**

$\frac{1}{9} = 1 \div 9 = 0.111...$

$21 + \frac{1}{9} = 21 + 0.11 = 21.11$

3. **(2)**

$\frac{6}{11} \times \frac{2}{5} = \frac{6 \times 2}{11 \times 5} = \frac{12}{55}$

4. **(4)**

$2\frac{4}{5} + 4\frac{2}{3} = 2\frac{12}{15} + 4\frac{10}{15} = 6\frac{22}{15} = 7\frac{7}{15}$

5. **(1)**

$\frac{4}{\cancel{7}_{1}} \times \frac{\overset{6}{\cancel{42}}}{} = 4 \times 6 = 24$

6. **(4)**

$1\frac{2}{3} \times 4 = \frac{5}{3} \times 4 = \frac{20}{3} = 6\frac{2}{3}$

7. **(4)**

$\frac{\cancel{1}}{\cancel{4}_{1}} \times \frac{\overset{3}{\cancel{12}}}{8} = \frac{3}{8}$

$\frac{\overset{2}{\cancel{8}}}{\cancel{11}_{1}} \times \frac{\overset{3}{\cancel{33}}}{\cancel{4}_{1}} = 6$

$\frac{9}{\cancel{12}_{4}} \times \frac{\overset{1}{\cancel{3}}}{5} = \frac{9 \times 1}{4 \times 5} = \frac{9}{20}$

$\frac{\cancel{4}^{1}}{\cancel{11}_{1}} \times \frac{\overset{3}{\cancel{33}}}{\cancel{8}_{2}} = \frac{1 \times 3}{1 \times 2} = \frac{3}{2}$

8. $7\frac{11}{12}$

$1\frac{1}{2} + 2\frac{2}{3} + 3\frac{3}{4} = 1\frac{6}{12} + 2\frac{8}{12} + 3\frac{9}{12} = 6\frac{23}{12} = 7\frac{11}{12}$

9. **1179**

Press [C] [1] [4] [$a\frac{b}{c}$] [5] [$a\frac{b}{c}$] [9] [×] [8] [1] [=]

10. $2\frac{1}{4}$

$9 \div 4 = \frac{9}{4} = 2\frac{1}{4}$

11. $3\frac{3}{5}$

$\frac{\overset{6}{\cancel{12}}}{5} \times \frac{3}{\cancel{2}_{1}} = \frac{6 \times 3}{5 \times 1} = \frac{18}{5} = 3\frac{3}{5}$

12. **56 km**

$\frac{7}{\cancel{12}_{1}} \times \frac{\overset{8}{\cancel{96}}}{} = 7 \times 8 = 56$

13. $\frac{3}{35}$

$\frac{\cancel{2}^{1}}{7} \times \frac{3}{\cancel{10}_{5}} = \frac{1 \times 3}{7 \times 5} = \frac{3}{35}$

14. **$59.45**

$\frac{1}{11} \times \$654 = \frac{654}{11} = 59\frac{5}{11}$

$59\frac{5}{11}$ $\$59 + \$0.454$

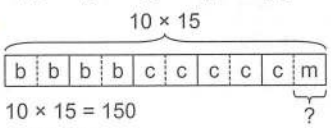
$= \$59.454$

$= \$59.45$ (2 d.p.)

$$\begin{array}{r} 0.4\,5\,4 \\ 11\overline{)\,5.0} \\ -\,4\,4 \\ \hline 6\,0 \\ -\,5\,5 \\ \hline 5\,0 \\ -\,4\,4 \\ \hline 6 \end{array}$$

15. $3\frac{1}{4}$

$8\frac{7}{12} - 5\frac{1}{3} = 8\frac{7}{12} - 5\frac{4}{12} = 3\frac{3}{12} = 3\frac{1}{4}$

16. 

b: blackcurrant
c: chocolate
m: mango

$10 \times 15 = 150$

$150 \div 10 = 15$

There were **15** mango-flavoured sweets.

17. $5\frac{1}{5} - 3\frac{1}{2} = 1\frac{7}{10}$ *l*

The bottle holds $1\frac{7}{10}$ *l* of water.

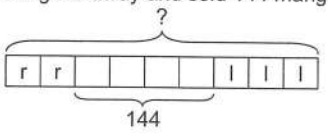
$5\frac{1}{5} + 1\frac{7}{10} = 6\frac{9}{10}$ *l*

$6\frac{9}{10} \div 30 = \frac{\overset{23}{\cancel{69}}}{10} \times \frac{1}{\cancel{30}_{10}} = \frac{23 \times 1}{10 \times 10} = \frac{23}{100}$ *l*

$\frac{23}{100} \times 1000 = 230$ m*l*

Each glass contains **230 m*l*** of water.

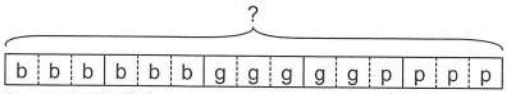
18. $(7 \times 18) + 18 = 144$
He gave away and sold 144 mangoes.



r: rotten
l: left

$144 \div 4 = 36$
$9 \times 36 = 324$
He had **324** mangoes at first.

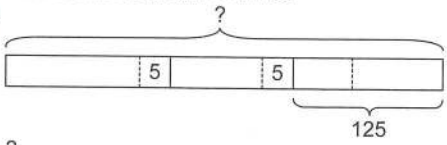
19.



b: blue
g: green
p: purple

6 – 4 parts = 32
2 parts = 32
1 part = 32 ÷ 2 = 16
15 parts = 15 × 16 = 240
Eddie had **240** marbles at first.

20.



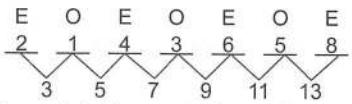
$\frac{2}{3}$ of the remaining apples = 5 + 125 = 130
$\frac{1}{3}$ of the remaining apples = 130 ÷ 2 = 65
$\frac{2}{3}$ of the apples at first = (130 + 65) + 5
= 195 + 5
= 200
$\frac{1}{3}$ of the apples at first = 200 ÷ 2 = 100
3 × 100 = 300
Mrs Jones had **300** apples at first.

Non-Routine Questions 1 (Questions available online.)

1. 1234 × 789 = 973 626
2345 × 678 = 1 589 910
3456 × 567 = 1 959 552

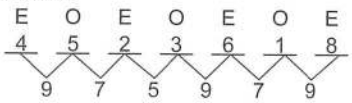
1234	973 626	789
2345	**1 589 910**	678
3456	**1 959 552**	567

2. Use 'Guess and Check' method.
Guess 1:



Guess 1 is incorrect since digits do not add up to 975979.

Guess 2:



Guess 2 fits all conditions. Hence, I am **4 523 618**.

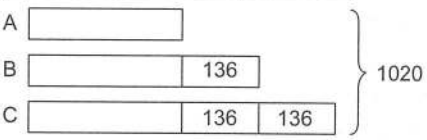
3. (*Other correct answers are acceptable.*)
Step 1: Cut the orange into half (1st cut).
Step 2: Stack the two half oranges.
Step 3: Cut the oranges into half (2nd cut).

4. Jason : Marcus : Andy
1×5 : 2×5
5×2 : 7×2
5 : 10 : 14
14 – 10 parts = 144
1 part = 144 ÷ 4 = 36
14 – 5 parts = 9 × 36
9 parts = 324
The difference between the number of stamps collected by Jason and Andy is **324.**

5. 6 + 2 = 8
10 + 18 = 28
120 – 46 = 74

6	2	8
10	18	28
46	**74**	120

6.



1020 – (3 × 136) = 612
612 ÷ 3 = 204
There are 204 sweets in container A.
204 + 136 = 340
There are 340 sweets in container B.
340 + 136 = 476
There are 476 sweets in container C.
A : B : C
204 : 340 : 476
3 : 5 : 7
The ratio of the number of sweets in container A to the number of sweets in container B to the number of sweets in container C is **3 : 5 : 7**.

7. $y = \frac{2}{3} \times 6 = 4$ cm
base of each small triangle = 10 ÷ 2
= 5 cm
Area of each unshaded triangle = $\frac{1}{2}$ × base × height
= $\frac{1}{2} \times 5 \times 4$
= 10 cm²
The area of each unshaded triangle is **10 cm²**.

8. last digit = 5
third digit = $1\frac{3}{5} \times 5 = 8$
second digit = $\frac{3}{4} \times 8 = 6$
first digit = $\frac{2}{3} \times 6 = 4$
Christine earns **$4685.**

9. Possible values of M when it is divided by 4
63, 67, 71, 75, 79, (83), 87
Possible values of M when it is divided by 5
68, 73, 78, (83), 88
83 ÷ 4 = 20 R 3
83 ÷ 5 = 16 R 3
M is **83**.

10. $y = \frac{3}{4} \times 8 = 6$ cm

base = $1\frac{3}{4} \times 8 = 14$ cm

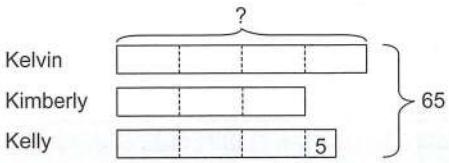
shaded area = $\left(\frac{1}{2} \times 14 \times 8\right) - \left(\frac{1}{2} \times 14 \times 6\right)$

$= 56 - 42$

$= 14$ cm²

The shaded area is **14 cm²**.

11.



65 – 5 = 60

60 ÷ 10 = 6

4 × 6 = 24

Kelvin is the oldest among the three of them.

The age of the oldest person is **24 years old**.

12. first : second third : last first : last

3 : 1 1 : 3 2 : 3

Multiply the ratio of the first digit to the last digit by 3.

first : last

2 × 3 : 3 × 3

6 : 9

Multiply the ratio of the first digit to the second digit by 2.

first : second

3 × 2 : 1 × 2

6 : 2

Multiply the ratio of the third digit to the last digit by 3.

third : last

1 × 3 : 3 × 3

3 : 9

6 + 2 + 3 + 9 = 20

I am **6239**.

Unit 6: Area of Triangles

Identify the base and height of a triangle

(A) 1. **BC/CB**
2. **DE/ED**
3. **NL/LN**
4. **PQ/QP**
5. **TR/RT**
6. **VW/WV**
7. **WX/XW**
8. **JG/GJ**

(B) 1. **BC/CB**
2. **DE/ED**
3. **KM/MK**
4. **TP/PT**
5. **WX/XW**
6. **CD/DC**
7. **HK/KH**
8. **OL/LO**

Apply the formula to calculate the area of triangles

1. Base = **4**
Height = **7**
Area = $\frac{1}{2}$ × base × height
$= \frac{1}{2} \times 4 \times 7$
= **14**

2. Base = **20**
Height = **16**
Area = $\frac{1}{2}$ × base × height
$= \frac{1}{2} \times 20 \times 16$
= **160**

3. Base = **8**
Height = **37**
Area = $\frac{1}{2}$ × base × height
$= \frac{1}{2} \times 8 \times 37$
= **148**

4. Base = **4 or 3**
Height = **3 or 4**
Area = $\frac{1}{2}$ × base × height
$= \frac{1}{2} \times 4 \times 3$
= **6**

5. Base = **12 or 5**
Height = **5 or 12**
Area = $\frac{1}{2}$ × base × height
$= \frac{1}{2} \times 12 \times 5$
= **30**

Find the area of shaded triangles and composite figures

1. **72 cm²**
Area = $\frac{1}{2}$ × base × height
$= \frac{1}{2} \times 9 \times 16$
= 72 cm²

2. **15 cm²**
Area = $\frac{1}{2}$ × base × height
$= \frac{1}{2} \times 3 \times 10$
= 15 cm²

3. **76 cm²**
Area = $\frac{1}{2}$ × base × height
$= \frac{1}{2} \times 8 \times 19$
= 76 cm²

4. **207 cm²**
Area = $\frac{1}{2}$ × base × height
$= \frac{1}{2} \times 23 \times 18$
= 207 cm²

5. **60 cm²**

Area = $\frac{1}{2}$ × base × height

= $\frac{1}{2}$ × 15 × 8

= 60 cm²

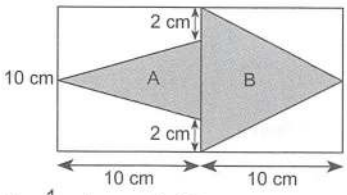
6. **120 cm²**

Area = $\frac{1}{2}$ × base × height

= $\frac{1}{2}$ × 30 × 8

= 120 cm²

7. **80 cm²**



A = $\frac{1}{2}$ × base × height

= $\frac{1}{2}$ × (10 – 2 – 2) × 10

= $\frac{1}{2}$ × 6 × 10

= 30 cm²

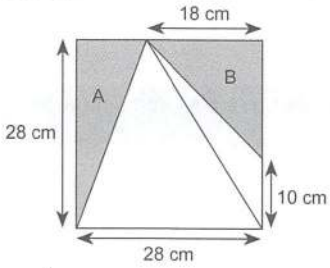
B = $\frac{1}{2}$ × base × height

= $\frac{1}{2}$ × 10 × 10

= 50 cm²

30 + 50 = 80 cm²

8. **302 cm²**



A = $\frac{1}{2}$ × base × height

= $\frac{1}{2}$ × (28 – 18) × 28

= 140 cm²

B = $\frac{1}{2}$ × base × height

= $\frac{1}{2}$ × 18 × (28 – 10)

= 162 cm²

140 + 162 = 302 cm²

9. **676 cm²**

$\left(\frac{1}{2} \times 52 \times 48\right) - \left[\frac{1}{2} \times 52 \times (48 - 26)\right]$ = 1248 – 572

= 676 cm²

10. **48 cm²**

$4 \times \left(\frac{1}{2} \times 4 \times 6\right)$ = 48 cm²

11. **108 cm²**

$\frac{1}{2} \times 24 \times 18$ = 216 cm²

216 ÷ 2 = 108 cm²

12. **330.5 cm²**

$2 \times \left(\frac{1}{2} \times 16 \times 20\right) + \left(\frac{1}{2} \times 7 \times 3\right)$ = 320 + 10.5

= 330.5 cm²

13. **128 cm²**

$4 \times \left(\frac{1}{2} \times 8 \times 8\right)$ = 128 cm²

14. **40 cm²**

20 ÷ 5 = 4 cm

$5 \times \left(\frac{1}{2} \times 4 \times 4\right)$ = 40 cm²

Unit 7: Ratio

Find ratio and equivalent ratio of two or three given quantities

(A) 1. **6 : 5**

5 : 6

2. **8 : 3**

3 : 8

3. chickens : ducks — 15 : 9 — **5 : 3**; ducks : chickens — 9 : 15 — **3 : 5**

4. boys : girls — 24 : 16 — **3 : 2**; girls : boys — 16 : 24 — **2 : 3**

5. shaded : unshaded — **9 : 7**; unshaded : shaded — **7 : 9**

6. Stick A : Stick B — 30 : 45 — **2 : 3**; Stick B : Stick A — 45 : 30 — **3 : 2**

7. Tree A : Tree B — 3 : 12 — **1 : 4**; Tree B : Tree A — 12 : 3 — **4 : 1**

8. **2 : 1**

1 : 2

watermelon : papaya — 4 : 2 — **2 : 1**; papaya : watermelon — 2 : 4 — **1 : 2**

9. Container A : Container B — 750 : 150 — **5 : 1**

Container B : Container A — 150 : 750 — **1 : 5**

10. (a) Perimeter of rectangle A = (8 × 2) + (5 × 2)

= 26 cm

Perimeter of rectangle B = (4 × 2) + (8 × 2)

= 24 cm

A : B — ÷ 2 (26 : 24 → **13 : 12**) ÷ 2

B : A — ÷ 2 (24 : 26 → **12 : 13**) ÷ 2

(b) Area of rectangle A = 8 × 5 = 40 cm²

Area of rectangle B = 4 × 8 = 32 cm²

A : B — ÷ 8 (40 : 32 → **5 : 4**) ÷ 8

B : A — ÷ 8 (32 : 40 → **4 : 5**) ÷ 8

11. hearts : triangles : stars
6 : 4 : 8
3 : 2 : 4

12. **5 : 9 : 7**

13. rocks : twigs : leaves
12 : 15 : 6
4 : 5 : 2

14. **4 : 6 : 9**

15. apples : pears : oranges
15 : 25 : 30
3 : 5 : 6

(B) 1. **25**

$\times 5$ (8 : 5 ; 40 : 25) $\times 5$

2. **21**

$\times 3$ (6 : 7 ; 18 : 21) $\times 3$

3. **8**

$\div 12$ (108 : 96 ; 9 : 8) $\div 12$

4. **36**

$\times 6$ (9 : 6 ; 54 : 36) $\times 6$

5. **7**

$\div 11$ (77 : 88 ; 7 : 8) $\div 11$

6. **63; 36**

3) $\times 9$: 7) $\times 9$: 4) $\times 9$
27 : 63 : 36

7. **10; 25**

2) $\times 5$: 9) $\times 5$: 5) $\times 5$
10 : 45 : 25

8. **9; 7**

72) $\div 8$: 48) $\div 8$: 56) $\div 8$
9 : 6 : 7

9. **32; 12**

8) $\times 4$: 6) $\times 4$: 3) $\times 4$
32 : 24 : 12

10. **5; 8**

60) $\div 12$: 96) $\div 12$: 36) $\div 12$
5 : 8 : 3

Reduce a ratio to its simplest form

1. **7 : 9**

$\div 3$ (21 : 27 ; 7 : 9) $\div 3$

2. **2 : 7**

$\div 9$ (18 : 63 ; 2 : 7) $\div 9$

3. **8 : 7**

$\div 8$ (64 : 56 ; 8 : 7) $\div 8$

4. **5 : 24**

$\div 5$ (25 : 120 ; 5 : 24) $\div 5$

5. **7 : 5**

$\div 12$ (84 : 60 ; 7 : 5) $\div 12$

6. **2 : 3 : 6**

36) $\div 18$: 54) $\div 18$: 108) $\div 18$
2 : 3 : 6

7. **9 : 19 : 14**

45) $\div 5$: 95) $\div 5$: 70) $\div 5$
9 : 19 : 14

8. **4 : 3 : 9**

100) $\div 25$: 75) $\div 25$: 225) $\div 25$
4 : 3 : 9

9. **9 : 5 : 6**

90) $\div 10$: 50) $\div 10$: 60) $\div 10$
9 : 5 : 6

10. **7 : 6 : 5**

91) $\div 13$: 78) $\div 13$: 65) $\div 13$
7 : 6 : 5

Solve word problems related to ratio

(A) 1. (a) **13 : 21**

boys : all students

$\div 2$ (26 : 42 ; 13 : 21) $\div 2$

(b) **8 : 13**

42 – 26 = 16

There are 16 girls on the school bus.

girls : boys

$\div 2$ (16 : 26 ; 8 : 13) $\div 2$

2. **1 : 3**

46 ÷ 2 = 23

There are 23 comic books on the shelf.

46 + 23 = 69

There are 69 books on the shelf.

comic books : all books

$\div 23$ (23 : 69 ; 1 : 3) $\div 23$

3. **5 : 13**

15 + 24 = 39

The distance from Town A to Town B is 39 km.

$\div 3$ (15 : 39 ; 5 : 13) $\div 3$

4. (a) **16 : 29**

postcard : letter

$\div 5$ (80 : 145 ; 16 : 29) $\div 5$

(b) **5 : 9**

200-g parcel : 300-g parcel

$\div 100$ (500 : 900 ; 5 : 9) $\div 100$

(c) **4 : 15**

3 × $0.80 = $2.40

The postage for 3 postcards is $2.40.

postcards : parcel

$\div 60$ (240 : 900 ; 4 : 15) $\div 60$

5. **3 : 6 : 5**
triangles : squares : crosses
3 : 6 : 5

6. **2 : 3 : 9**
A : C : total
2 : 3 : (2 + 4 + 3)
2 : 3 : 9

7. **14 : 19 : 8**
senior citizen : adult : child
42 : 57 : 24 (÷ 3)
14 : 19 : 8

8. **2 : 1**
longest : shortest
16 : 8 (÷ 8)
2 : 1

(B) 1. adults : children
5 : 6 (× 17)
85 : 102
85 + 102 = 187
There are **187** people in the library.

2. (8 – 3) parts = 245
5 parts = 245
1 part = 245 ÷ 5 = 49
8 parts = 8 × 49 = 392
There are **392** pairs of boots in the shop.

3. weekday : weekend
3 : 4 (× 14)
42 : 56
2 × $56 = $112
He earns **$112** for working on Saturday and Sunday.

4. (a) roses : all flowers
22 : 22 + 12 + 16
22 : 50 (÷ 2)
11 : 25
The ratio of the number of roses to the total number of flowers in the bouquet is **11 : 25**.

(b) daisies : carnations
1 : 3 (× 12)
12 : 36
36 – 16 = 20
20 carnations must be added to the bouquet so that the ratio of the number of daisies to the number of carnations becomes 1 : 3.

5. $\frac{3}{7}$ × 3500 = 1500 g
1500 g of flour is used for baking the tarts.
3500 – 1500 – 700 = 1300 g
cake : tarts : remaining flour
700 : 1500 : 1300 (÷ 100)
7 : 15 : 13
The ratio of the amount flour used for baking the cake to the amount of flour used for baking the tarts to the remaining amount of flour is **7 : 15 : 13**.

6. (a) Peter : Katty : Russell
2 : 5 : 4 (× 36)
72 : 180 : 144
$72 + $180 + $144 = $396
The sum of money is **$396**.

(b) $180
Katty
Peter
$72 ?
$180 – $72 = $108
$108 ÷ 2 = $54
Katty must give **$54** to Peter so that both will get an equal share.

7. Trina : Patty : Alice
7 : 6
3 : 5 (× 2)
7 : 6 : 10 (× 2)
Alice : total stamps
10 : 7 + 6 + 10
10 : 23
The ratio of the number of stamps that Alice has to the total number of stamps that the three girls have is **10 : 23**.

8. $64 ÷ 2 = $32
The cost of each adult train ticket is $32.
adult : child
8 : 5 (× 4)
32 : 20
The cost of a child train ticket is **$20**.

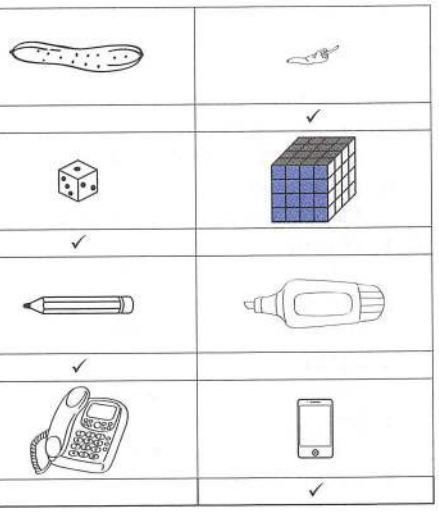
Unit 8: Volume of Cubes and Cuboids

Compare the volumes of solids

1. (a) ✓
(b) ✓
(c) ✓
(d) ✓
(e) ✓

1. (a) ✓

(b)



(c)

(d)

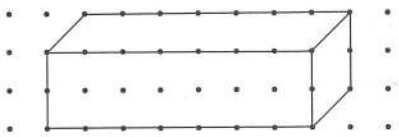
(e)

Calculate the unit cubes in a solid

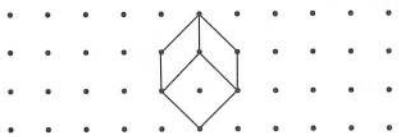
1. 7; 10; B; A
2. 9; 7; D; C
3. 10; 12; 13; G; F; E
4. 17; 13; 20; J; H; K

Draw a cube or cuboid on dot paper

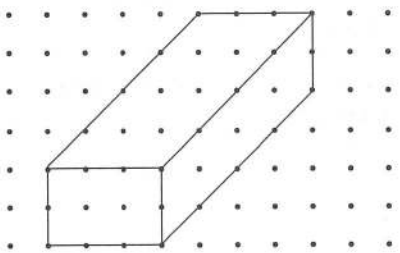
(A) 1.



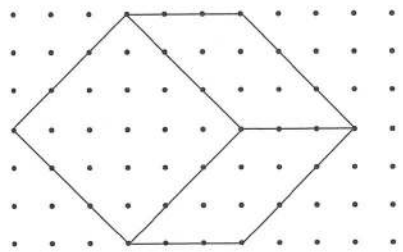
2.



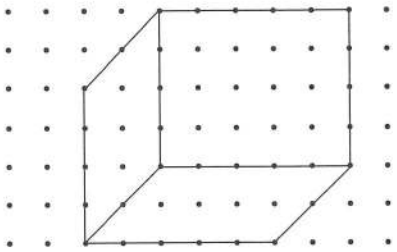
3.



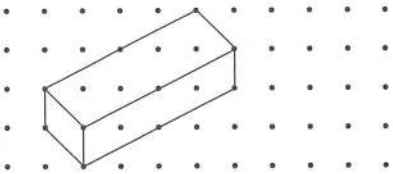
4.



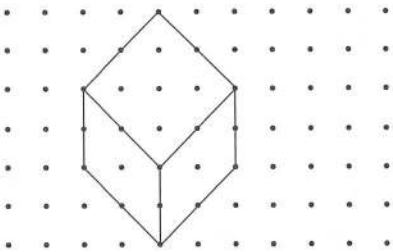
5.



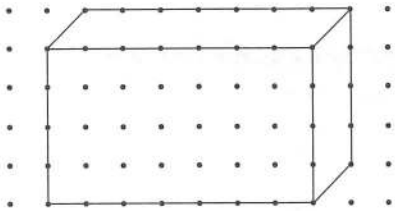
(B) 1.



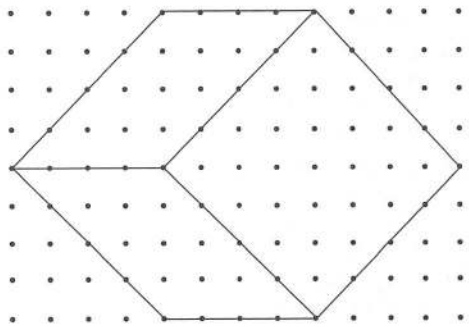
2.

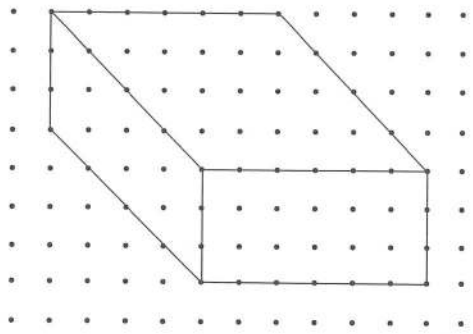


3.

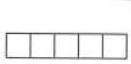
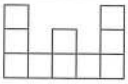


4.



5. 

(C)

	Top View	Front View	Side View
1.			
2.			
3.			
4.			
5.			

Find volume of a solid using formula

(A) 1. Length = **4 cm**
Breadth = **3 cm**
Height = **6 cm**
Volume = 4 × 3 × 6 = **72 cm³**

2. Length = **5 cm**
Breadth = **5 cm**
Height = **5 cm**
Volume = 5 × 5 × 5 = **125 cm³**

3. Length = **8 cm**
Breadth = **6 cm**
Height = **5 cm**
Volume = 8 × 6 × 5 = **240 cm³**

4. Length = **7 cm**
Breadth = **7 cm**
Height = **7 cm**
Volume = 7 × 7 × 7 = **343 cm³**

(B) 1. Length = **25 cm**
Breadth = **3 cm**
Height = **3 cm**
Volume = 25 × 3 × 3 = **225 cm³**

2. Length = **16 cm**
Breadth = **7 cm**
Height = **9 cm**
Volume = 16 × 7 × 9 = **1008 cm³**

3. Edge = **9 cm**
Volume = 9 × 9 × 9 = **729 cm³**

4. Edge = **11 cm**
Volume = 11 × 11 × 11 = **1331 cm³**

5. Length = **8 cm**
Breadth = **7 cm**
Height = **10 cm**
Volume = **8 × 7 × 10 = 560 cm³**

6. Length = **13 cm**
Volume = 13 × 13 × 13 = **2197 cm³**

(C) 1. **960 cm³**
Volume = 10 × 8 × 12 = 960

2. **360 cm³**
Volume = 4 × 5 × 18 = 360

3. **3375 cm³**
Volume = 15 × 15 × 15 = 3375

4. **5832 cm³**
Volume = 18 × 18 × 18 = 5832

4. **81 cm³**
Volume = 3 × 3 × 9 = 81

6. **10 648 cm³**
Volume = 22 × 22 × 22 = 10 648

7. **2002 cm³**
Volume = 14 × 13 × 11 = 2002

8. **17 576 cm³**
Volume = 26 × 26 × 26 = 17 576

Convert volume between cm³, *l* and m*l*

(A) 1. **315 cm³**
315 m*l* = 315 cm³

2. **1200 cm³**
1 *l* = 1000 m*l* = 1000 cm³
1 *l* 200 m*l* = 1000 + 200 = 1200 cm³

3. **19 003 cm³**
19 *l* = 19 000 m*l* = 19 000 cm³
19 *l* 3 m*l* = 19 000 + 3 = 19 003 cm³

4. **59 cm³**
59 m*l* = 59 cm³

5. **43 007 cm³**
43 *l* = 43 000 m*l* = 43 000 cm³
43 *l* 7 m*l* = 43 000 + 7 = 43 007 cm³

6. **20 088 cm³**
20 *l* = 20 000 m*l* = 20 000 cm³
20 *l* 88 m*l* = 20 000 + 88 = 20 088 cm³

7. **5005 cm³**
5 *l* = 5000 m*l* = 5000 cm³
5 *l* 5 m*l* = 5000 + 5 = 5005 cm³

8. **10 101 cm³**
10 *l* = 10 000 m*l* = 10 000 cm³
10 *l* 101 m*l* = 10 000 + 101 = 10 101 cm³

9. **9099 cm³**
9 *l* = 9000 m*l* = 9000 cm³
9 *l* 99 m*l* = 9000 + 99 = 9099 cm³

10. **23 456 cm³**
23 *l* = 23 000 m*l* = 23 000 cm³
23 *l* 456 m*l* = 23 000 + 456 = 23 456 cm³

(B) 1. **755 m*l***
755 cm³ = 755 m*l*

2. **3 *l* 4 m*l***
3004 cm³ = 3000 m*l* + 4 m*l* = 3 *l* 4 m*l*

3. **5 l 60 ml**
   5060 cm^3 = 5000 ml + 60 ml = 5 l 60 ml
4. **75 l 70 ml**
   75 070 cm^3 = 75 000 ml + 70 ml = 75 l 70 ml
5. **14 l 5 ml**
   14 005 cm^3 = 14 000 ml + 5 ml = 14 l 5 ml
6. **48 l 276 ml**
   48 276 cm^3 = 48 000 ml + 276 ml = 48 l 276 ml
7. **87 ml**
   87 cm^3 = 87 ml
8. **2 l 200 ml**
   2200 cm^3 = 2000 ml + 200 ml = 2 l 200 ml
9. **19 l 800 ml**
   19 800 cm^3 = 19 000 ml + 800 ml = 19 l 800 ml
10. **83 l 308 ml**
    83 308 cm^3 = 83 000 ml + 308 ml = 83 l 308 ml

Solve word problems related to volume of cube and cuboid and volume of liquid

1. 13 × 25 × 12 = 3900 cm^3
   Its capacity is **3900 cm^3**.
2. 13 × 13 × 13 = 2197 cm^3
   Its volume is **2197 cm^3**.
3. 38 × 17 × 9.5 = 6137 cm^3
   Its volume is **6137 cm^3**.
4. $\frac{1}{2}$ × 600 × 19 = 5700 cm^3
   5700 ÷ 1000 = 5.7 l
   5.7 l of water are needed to fill the tank completely.
5. 24 × 24 × 24 = 13 824 cm^3
   13 824 ÷ 384 = 36
   He will need **36** bottles of water to fill the tank completely.
6. (a) $1 - \frac{3}{4} = \frac{1}{4}$
   $\frac{1}{4}$ × 30 × 12.5 × 20 = 1875 cm^3
   1875 ÷ 1000 = 1.875 l
   1.875 l of water is needed to fill the tank to its brim.
   (b) 1875 ÷ 3 = 625
   625 cm^3 of water flows from the tap per minute.
7. 70 × 90 × 110 = 693 000 cm^3
   693 000 – 5880 = 687 120 cm^3
   687 120 ÷ 1000 = 687.12 l
   687.12 l of water is in the fish pond.
8. 100 – 75 = 25 %
   $\frac{25}{100}$ × 48 × 38 × 28 = 12 768 cm^3
   12 768 cm^3 of water will be needed to fill the tank to its brim.
9. 1.5 l = 1.5 × 1000 = 1500 cm^3
   5 × 5 × 6 = 150 cm^3
   1500 ÷ 150 = 10
   10 such beakers of water are needed to fill the pail to its brim.
10. (a) $\frac{2}{3}$ × 18 × 26 × 24 = 7488
    The volume of water in the tank is **7488 cm^3**.
    (b) 13 × 16 × 9 = 1872 cm^3
    7488 + 1872 = 9360
    9360 ÷ 1000 = 9.36 l
    The new volume of water in the tank is **9.36 l**.
11. $\frac{3}{4}$ × 40 × 40 × 41.25 = 49 500 cm^3
    4.5 l = 4.5 × 1000 = 4500 ml = 4500 cm^3
    49 500 ÷ 4500 = 11
    Victor should turn the tap on for **11 minutes** if he wants to fill only $\frac{3}{4}$ of the tank.

Review 3 (Questions available online.)

1. **(4)**
   4 l = 4 × 1000 = 4000 cm^3
   4 l 325 ml = 4000 + 325 = 4325 cm^3
2. **(2)**
   Base area = 8 × 8 = 64 cm^2
   Volume = 8 × 8 × 8 = 512 cm^3
3. **(1)**

	Molly	:	Hilda	
× 8	4	:	9	× 8
	32	:	72	

4. **(2)**
   Base of shaded triangle = 30 – 15
   = 15 cm
   Area of shaded triangle = $\frac{1}{2}$ × 15 × 20
   = 150 cm^2
5. **(2)**
   Rose [| 48] } 96
   Delia [?]

	Delia	:	Rose
	24	:	24 + 48
÷ 24	24	:	72 ÷ 24
	1	:	3

6. **(2)**
   3 years 6 months – 1 year = 2 years 6 months

	Penny	:	Henry
	3 yr 6 mth	:	2 yr 6 mth
÷ 6	42	:	30 ÷ 6
	7	:	5

7. **(2)**
   $\frac{1}{2}$ × base × height = $\frac{1}{2}$ × 24 × 12 = 144 cm^2
8. **80 cm^3**
   Volume = 5 × 4 × 4 = 80 cm^3
9. (a) **12 012 cm^3**
   1000 ml = 1000 cm^3
   12 012 ml = 12 012 cm^3
   (b) **500 l 50 ml**
   500 050 cm^3 = 500 000 ml + 50 ml
   = 500 l 50 ml
10. **3168 cm^3**
    16 × 18 × 11 = 3168 cm^3
11. **164 cm**
    (3 + 4) parts = 287 cm
    1 part = 287 ÷ 7
    = 41 cm
    4 parts = 4 × 41
    = 164 cm

12. **6 : 9 : 11**

squares : triangles : circles
6 : 9 : 11

13. **7536 non-fiction books**

	fiction	:	non-fiction	
× 2512	5	:	3	× 2512
	12 560	:	7536	

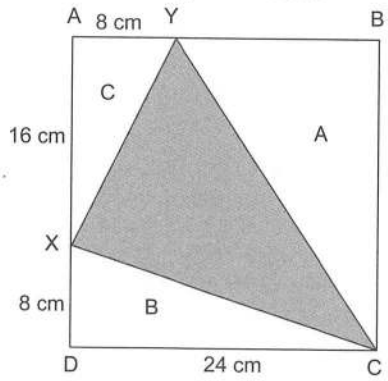
14. **13 cm²**

$\frac{1}{2}$ × base × height = $\frac{1}{2}$ × 2 × 13
= 13 cm²

15. **55 cm²**

$\frac{1}{2}$ × base × height = $\frac{1}{2}$ × (45 – 40) × 22
= 55 cm²

16. 96 ÷ 4 = 24 cm
Each side of the square is 24 cm.



Area of square ABCD = 24 × 24 = 576 cm²
Area of triangle A = $\frac{1}{2}$ × (24 – 8) × 24
= 192 cm²
Area of triangle B = $\frac{1}{2}$ × 24 × 8
= 96 cm²
Area of triangle C = $\frac{1}{2}$ × 8 × 16
= 64 cm²
Area of shaded triangle = 576 – 192 – 96 – 64
= 224 cm²
The area of the shaded triangle is **224 cm²**.

17. (5 + 3 + 2) parts = 970
1 part = 970 ÷ 10
= 97
(5 – 2) parts = 3 × 97
3 parts = 291
There were **291** fewer Indonesian tourists than Japanese tourists.

18. **Volume** = $\frac{1}{2}$ × 896 × 22
= 9856 cm³
9856 ÷ 44 = 224
The cup must be used 224 times to empty water from the container.

19. Area of whole figure (4 small triangles) = $\frac{1}{2}$ × 28 × 20
= 280 cm²
Area of each small triangle = 280 ÷ 4
= 70 cm²
The area of each triangle is **70 cm²**.

20.

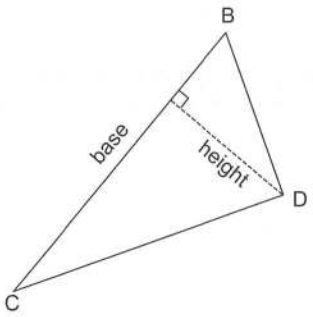
	sweets	:	chocolates	
× 4	3	:	5	× 2
	12	:	10	

[(12 – 3) + (10 – 5)] parts = 406
(9 + 5) parts = 406
1 part = 406 ÷ 14 = 29
(12 + 10) parts = 22 × 29 = 638
The total number of chocolates and sweets in the shop is now **638**.

(Questions available online.
Revision Test 1 Also available on Geniebook.)

1. **(3)**
9 403 512 = 9 000 000 + 400 000 + 3000 + 500 + 12

2. **(3)**



3. **(4)**
Area = $\frac{1}{2}$ × base × height
= $\frac{1}{2}$ × 4 × 2
= 4 cm²

4. **(3)**

5. **(2)**

	Josie	:	both girls	
	36	:	36 + 54	
÷18	36	:	90	÷18
	2	:	5	

6. **(3)**
$\frac{7}{\cancel{8}_{1}} \times \overset{80}{\cancel{120}} = 560$

7. **(2)**
1255 × 60 = 1255 × 6 × 10
= 7530 × 10
= 75 300

8. **(4)**
24 × 13 × 7 = 2184 cm³

9. **(3)**
$8\frac{4}{5}$ of 30 = $8\frac{4}{5} \times 30$
= $\frac{44}{\cancel{5}_{1}} \times \cancel{30}^{6}$
= 264

10. **(3)**
9 090 909

11. **(3)**
Area of triangle DAB = $\frac{1}{2}$ × base × height
= $\frac{1}{2}$ × 12 × 12
= 72 cm²

12. **(1)**
$\$10 = 10 \times 100 = 1000¢$

÷ 250	250 : 1000	÷ 250
	1 : 4	

13. **(3)**
$7\frac{5}{7} = 7 + \frac{5}{7}$
$\approx 7 + 0.714$
$= 7.71$ (2 decimal places)

$$7\overline{)5.0} = 0.714$$
-49
10
-7
30
-28
2

14. **(3)**
$12\frac{1}{5} - 5\frac{1}{10} = 12\frac{2}{10} - 5\frac{1}{10}$
$= 7\frac{1}{10}$

15. **(4)**
$\$6384 \div \$21 = 304$
$304 \times 2 = 608$

16. **four million, five hundred and fifty-four thousand, and forty-five**

17. **6 039 063**

18. **492 cm²**
$\frac{1}{2} \times 41 \times 24 = 492\ cm^2$

19. **4 : 17**

	fail : pass	
	8 : 42 − 8	
÷ 2	8 : 34	÷ 2
	4 : 17	

20. **1160 cm²**
$\frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times (32 + 8) \times 58$
$= \frac{1}{2} \times 40 \times 58$
$= 1160\ cm^2$

21. **$1440**
$12 \times 12 \times 10 = 1440$

22. **15 cm²**
$\frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 5 \times 6$
$= 15\ cm^2$

23. **57**
$4\frac{6}{8} \times 12 = \frac{38}{\cancel{8}_2} \times \overset{3}{\cancel{12}} = \frac{114}{2} = 57$

24. **3 509 000**

25. **1.25 litres**
$3750 + 8750 = 12\ 500\ m\ell$
$12\ 500 \div 10 = 1250\ m\ell$
$1250 \div 1000 = 1.25$ litres

26. **10**

18	÷ 3 :	30	÷ 3 :	72	÷ 3
6	:	10	:	24	

27. $\frac{1}{5} \times 45 \times 24 \times 30 = 6480\ cm^3$
$6480 \div 1000 = 6.48\ \ell$
6.48 ℓ of water is poured out from the tank.

28. **750 g**
$1 - \frac{3}{4} = \frac{1}{4}$
$\frac{1}{4} \times 3000 = 750$ g

29. **1 : 5**

Derrick	:	father	
8	:	32 + 8	
8	:	40	÷ 8
1	:	5	

30. **6992**
$80 \times (69 + 22) - 288 = 80 \times 91 - 288$
$= 6992$

31. **237**
$75 \times 3 + 108 \div (27 \div 3) = 225 + 108 \div 9$
$= 225 + 12$
$= 237$

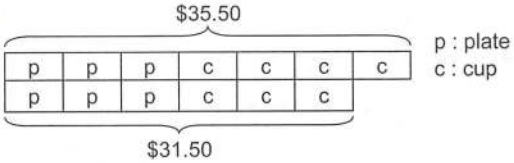
32. **3 394 500**
$6789 \times 500 = 6789 \times 5 \times 100$
$= 33\ 945 \times 100$
$= 3\ 394\ 500$

33. $\mathbf{10\frac{19}{45}}$
$\frac{36}{5} + \frac{29}{9} = 7\frac{1}{5} + 3\frac{2}{9}$
$= 7\frac{9}{45} + 3\frac{10}{45}$
$= 10\frac{19}{45}$

34. **622**
$4\ 976\ 000 \div 8000 = 4\ 976\ 000 \div 1000 \div 8$
$= 4976 \div 8$
$= 622$

35. **1045 cm**
$\frac{5}{6} \times 1254 = \frac{5}{\cancel{6}_2} \times \overset{209}{\cancel{1254}}$
$= 5 \times 209$
$= 1045$

36.



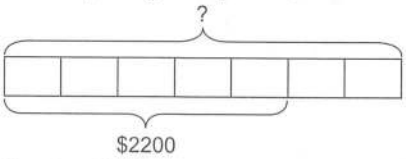
$\$35.50 - \$31.50 = \$4$
Each cup costs $4.
$\$35.50 - (4 \times \$4) = \$19.50$
The cost of 3 such plates is $19.50.
$3 \times \$19.50 = \$58.50$
The cost of 9 such plates is **$58.50**.

37. $\frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 5 \times 8 = 20\ cm^2$
The area of each triangle is 20 cm².
$8 \times 20 = 160$
The area of the octagon is **160 cm²**.

38. $6\frac{1}{4} + 2\frac{7}{8} = 9\frac{1}{8}$
The mass of Basket B is $9\frac{1}{8}$ kg.
$21\frac{3}{5} - 6\frac{1}{4} - 9\frac{1}{8} = 6\frac{9}{40}$
The mass of Basket C is $6\frac{9}{40}$ kg.
$6\frac{1}{4} = 6\frac{10}{40}$
The mass of Basket A is $6\frac{10}{40}$ kg.
$9\frac{1}{8} - 6\frac{9}{40} = 2\frac{9}{10}$
The difference between the mass of the heaviest and the lightest baskets of vegetables is $\mathbf{2\frac{9}{10}}$ **kg**.

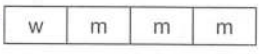
39. $112 \div 4 = 28$
The side of the smaller square is 28 cm.
$\times 4 \begin{pmatrix} 7 & : & 9 \\ 28 & : & 36 \end{pmatrix} \times 4$
$28 \times 28 = 784$
The area of the smaller square is 784 cm^2.
$36 \times 36 = 1296$
The area of the bigger square is 1296 cm^2.
$1296 - 784 = 512$
The difference in the area of the two squares is **512 cm^2**.

40. $2\frac{1}{2} \times \$880 = \frac{5}{2} \times \$880 = \$2200$
The tour package to Japan is $2200.

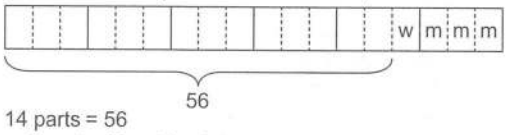


5 parts = $2200
1 part = $2200 ÷ 5 = $440
7 parts = 7 × $440 = $3080
The tour package to England is $3080.
$880 + $2200 + $3080 = $6160
The total cost of all the three tour packages is **$6160**.

41. Common factors of 3 and 4 = 12, 24, 36, 48, 60
12 spoons, 12 forks → (12 ÷ 4) × $3 – (12 ÷ 3) × $2
= $1 of difference
60 spoons, 60 forks → (60 ÷ 4) × $3 – (60 ÷ 3) × $2
= $5 of difference
(60 ÷ 4) × $3 + (60 ÷ 3) × $2 = $45 + $40
= $85
She spent **$85** altogether.

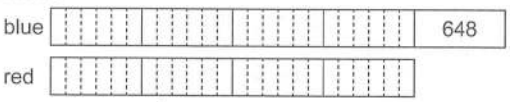
42. 

w : women
m : men
After 56 women joined the health club,



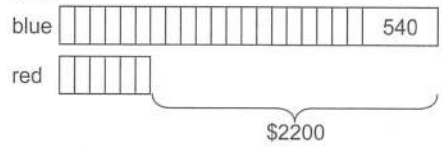
14 parts = 56
1 part = 56 ÷ 14 = 4
3 parts = 3 × 4 = 12
There were **12** men in the health club.

43. Before



sold (blue) → $\frac{1}{6} \times 648 = 108$
$648 - 108 = 540$
$\frac{1}{6} \times 24u = 4u$
$24u - 4u = 20u$
sold (red) → $\frac{3}{4} \times 24u = 18u$
$24u - 18u = 6u$

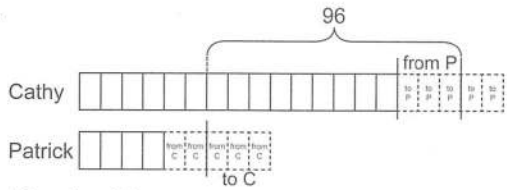
After



$14u = 1338 - 540$
$= 798$
$u = 798 \div 14$
$= 57$
blue → $24u + 648$
$= (24 \times 57) + 648$
$= 2016$
There were **2016** blue pens at first.

44. $\$108 \times 2 = \$216$
Andrew and Bertha collected $216.
$\$142 \times 2 = \$284$
Andrew and Chloe collected $284.
$\$284 - \$216 = \$68$
The difference in the amounts collected by Chloe and Bertha was $68.
Chloe : Bertha
3 : 1
3u – 1u = 2u
2u → $68
u → $34
Chloe $34 × 3 = $102
$216 + $102 = $318
The total amount of money collected for the class fund was **$318**.

45.



12 parts = 96
1 part = 96 ÷ 12
= 8
20 parts = 20 × 8
= 160
She had **160** trading cards at first.

46. (a) 5 parts = 60 + 5
= 65
1 part = 65 ÷ 5
= 13
13 – 5 = 8
Daphne was 8 years old five years ago
Daphne : grandmother
$\div 4 \begin{pmatrix} 8 & : & 60 \\ 2 & : & 15 \end{pmatrix} \div 4$
The ratio of Daphne's age five years ago to her grandmother's age five years ago is **2 : 15**.

(b) $\frac{2}{5} \times 65 = 26$
26 – 13 = 13
Daphne's age will be $\frac{2}{5}$ her grandmother's present age in **13** years.

47. **11 cups**

Volume = $\frac{1}{4} \times 121 \times 8 = 242\ cm^3$

$242 \div 22 = 11$

48. **1 cm**

Volume = $5 \times 6 \times H$

$30\ cm^3 = 30 \times H$

$H = 30 \div 30 = 1\ cm$

49. (a) $1568 \div 8 = 196\ cm^2$

The area of each square is $196\ cm^2$.

$196\ cm^2 = 14\ cm \times 14\ cm$

The side of each square is 14 cm.

$14 \times 2 = 28\ cm$

The base of the triangle is 28 cm.

$28 - 4 = 24\ cm$

The height of the triangle is **24 cm**.

(b) Area of triangle $= \frac{1}{2} \times 28 \times 24$

$= 336\ cm^2$

Area of figure $= 1568 + 336$

$= 1904\ cm^2$

1 square	:	triangle	:	figure
196 ÷ 28	:	336 ÷ 28	:	1904 ÷ 28
7	:	12	:	68

Calculator Skills (Questions available online.)

1. **9372**
Press [C] [8] [5] [2] [×] [1] [1] [=]
2. **612 297**
Press [C] [9] [7] [1] [9] [×] [6] [3] [=]
3. **35**
Press [C] [4] [2] [0] [÷] [1] [2] [=]
4. **294**
Press [C] [6] [7] [6] [2] [÷] [2] [3] [=]
5. **75**
Press [C] [7] [1] [+] [1] [3] [−] [9] [=]
6. **578**
Press [C] [5] [6] [2] [+] [1] [1] [2] [÷] [7] [=]
7. **1325**
Press [C] [2] [5] [×] [(] [3] [5] [+] [1] [8] [)] [=]
8. **10**
Press [C] [3] [6] [0] [0] [÷] [(] [9] [8] [2] [−] [6] [2] [2] [)] [=]
9. **8484**
Press [C] [(] [1] [4] [9] [−] [1] [2] [6] [+] [7] [8] [)] [×] [4] [2] [0] [÷] [5] [=]
10. **4888**
Press [C] [6] [9] [7] [8] [−] [1] [5] [×] [(] [2] [2] [×] [1] [9] [÷] [3] [)] [=]
11. **0.44**
Press [C] [4] [÷] [9] [=]
12. **0.55**
Press [C] [6] [÷] [1] [1] [=]
13. **0.13**
Press [C] [1] [÷] [8] [=]
14. **7.11**
Press [C] [1] [÷] [9] [+] [7] [=]
15. **13.73**
Press [C] [8] [÷] [1] [1] [+] [1] [3] [=]
16. $14\frac{3}{4}$
Press [C] [5] [a b/c] [1] [a b/c] [2] [+] [9] [a b/c] [1] [a b/c] [4] [=]
17. $36\frac{7}{24}$
Press [C] [2] [2] [a b/c] [1] [a b/c] [6] [+] [1] [4] [a b/c] [1] [a b/c] [8] [=]
18. $109\frac{68}{77}$
Press [C] [4] [9] [a b/c] [3] [a b/c] [7] [+] [6] [0] [a b/c] [5] [a b/c] [1] [1] [=]
19. $44\frac{2}{15}$
Press [C] [7] [8] [a b/c] [5] [a b/c] [6] [−] [3] [4] [a b/c] [7] [a b/c] [1] [0] [=]
20. $45\frac{1}{36}$
Press [C] [5] [3] [a b/c] [1] [a b/c] [4] [−] [8] [a b/c] [2] [a b/c] [9] [=]
21. $1\frac{11}{24}$
Press [C] [1] [4] [a b/c] [8] [×] [5] [a b/c] [6] [=]
22. $7\frac{4}{5}$
Press [C] [2] [6] [a b/c] [5] [×] [3] [a b/c] [2] [=]
23. $39\frac{1}{9}$
Press [C] [8] [8] [a b/c] [1] [2] [×] [1] [6] [a b/c] [3] [=]
24. $2\frac{1}{4}$
Press [C] [1] [8] [a b/c] [4] [×] [1] [a b/c] [2] [=]
25. **88**
Press [C] [1] [a b/c] [3] [a b/c] [8] [×] [6] [4] [=]
26. $484\frac{1}{2}$
Press [C] [5] [a b/c] [1] [a b/c] [1] [0] [×] [9] [5] [=]
27. $1733\frac{1}{3}$
Press [C] [1] [0] [4] [×] [1] [6] [a b/c] [2] [a b/c] [3] [=]
28. $144\frac{2}{3}$
Press [C] [2] [1] [×] [6] [a b/c] [8] [a b/c] [9] [=]
29. $\frac{1}{32}$
Press [C] [1] [a b/c] [4] [÷] [8] [=]
30. $\frac{1}{24}$
Press [C] [5] [a b/c] [1] [2] [÷] [1] [0] [=]
31. $\frac{3}{10}$
Press [C] [9] [a b/c] [1] [0] [÷] [3] [=]

32. $\frac{3}{11}$
Press [C] [6] [$a\frac{b}{c}$] [1] [1] [÷] [2] [=]

33. $\frac{1}{18}$
Press [C] [7] [$a\frac{b}{c}$] [9] [÷] [1] [4] [=]

34. $\frac{1}{32}$
Press [C] [3] [$a\frac{b}{c}$] [4] [÷] [2] [4] [=]

35. $\frac{1}{15}$
Press [C] [2] [$a\frac{b}{c}$] [5] [÷] [6] [=]

Unit 9: Decimals

Multiply and divide decimals by tens, hundreds, thousands and their multiples

(A) 1. 0.5 × 10 = **5**
2. 44.9 × 10 = **449**
3. 105.67 × 10 = **1056.7**
4. 26.093 × 10 = **260.93**
5. 0.08 × 100 = **8**
6. 37.71 × 100 = **3771**
7. 480.409 × 100 = **48 040.9**
8. 0.28 × 1000 = **280**
9. 184.6 × 1000 = **184 600**
10. 475.36 × 1000 = **475 360**
11. 3.2 = 0.32 × **10**
12. 70 = 0.7 × **100**
13. 9001 = 90.01 × **100**
14. **0.148** × 10 = 1.48
15. **0.065** × 100 = 6.5
16. **0.5** × 1000 = 500
17. 0.2 × **4** × **10** = **8**
18. 68.35 × **9** × **10** = **6151.5**
19. 9.4 × **3** × **100** = **2820**
20. 204.56 × **7** × **100** = **143 192**
21. 50.9 × **6** × **1000** = **305 400**
22. 74.21 × **3** × **1000** = **222 630**
23. **121.5** × 10 = **12.15** × 100 = **1.215** × 1000
24. 484.9 × **10** = 48.49 × **100** = 4.849 × 1000
25. **1200.8** × 10 = **120.08** × 100 = **12.008** × 1000

(B) 1. 7 ÷ 10 = **0.7**
2. 0.9 ÷ 10 = **0.09**
3. 95.73 ÷ 10 = **9.573**
4. 78.7 ÷ 100 = **0.787**
5. 5461 ÷ 100 = **54.61**
6. 425 ÷ 100 = **4.25**
7. 616 ÷ 1000 = **0.616**
8. 1003 ÷ 1000 = **1.003**
9. 20 120 ÷ 1000 = **20.12**
10. 71.62 ÷ **10** = 7.162
11. 187.9 ÷ **100** = 1.879
12. 807 ÷ **1000** = 0.807
13. **2.18** ÷ 10 = 0.218
14. **364.9** ÷ 100 = 3.649
15. **92** ÷ 1000 = 0.092
16. **13 550** ÷ 1000 = 13.55
17. 2.4 ÷ **2** ÷ **10** = **0.12**
18. 4.05 ÷ **5** ÷ **10** = **0.081**
19. 84 ÷ **7** ÷ **100** = **0.12**
20. 178 ÷ **4** ÷ **100** = **0.445**
21. 90 ÷ **3** ÷ **1000** = **0.03**
22. 954 ÷ **6** ÷ **1000** = **0.159**
23. 6.27 = **62.7** ÷ 10 = **627** ÷ 100 = **6270** ÷ 1000
24. 179.4 = **1794** ÷ 10 = **17 940** ÷ 100 = **179 400** ÷ 1000
25. 24.8 = 24 800 ÷ **1000** = 2480 ÷ **100** = 248 ÷ **10**

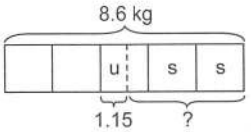
Convert metres to centimetres, kilometres to metres, kilograms to grams and litres to millilitres

(A) 1. 7.05 × 100 = **705 cm**
2. 9.163 × 100 = **916.3 cm**
3. 100.2 × 100 = **10 020 cm**
4. 35.36 × 100 = **3536 cm**
5. 228.577 × 100 = **22 857.7 cm**
6. 1.755 × 1000 = **1755 m**
7. 24.82 × 1000 = **24 820 m**
8. 69.95 × 1000 = **69 950 m**
9. 117.4 × 1000 = **117 400 m**
10. 205.512 × 1000 = **205 512 m**
11. 5.105 × 1000 = **5105 g**
12. 30.4 × 1000 = **30 400 g**
13. 171.7 × 1000 = **171 700 g**
14. 46.96 × 1000 = **46 960 g**
15. 0.258 × 1000 = **258 g**
16. 0.126 × 1000 = **126 m/**
17. 8.103 × 1000 = **8103 m/**
18. 19.6 × 1000 = **19 600 m/**
19. 20.09 × 1000 = **20 090 m/**
20. 101.1 × 1000 = **101 100 m/**
21. 0.095 × 1000 = 95 g
70.095 kg = **70 kg 95 g**
22. 0.04 × 1000 = 40 m/
66.04 / = **66 / 40 m/**
23. 0.96 × 100 = 96 cm
13.96 m = **13 m 96 cm**
24. 0.5 × 1000 = 500 m
45.5 km = **45 km 500 m**
25. 0.137 × 1000 = 137 m/
4.137 / = **4 / 137 m/**
26. 0.016 × 1000 = 16 m
8.016 km = **8 km 16 m**
27. 0.4 × 100 = 40 cm
312.4 m = **312 m 40 cm**
28. 0.58 × 1000 = 580 g
4.58 kg = **4 kg 580 g**

Convert centimetres to metres, metres to kilometres, grams to kilograms and millilitres to litres

(B) 1. 439 ÷ 100 = **4.39 m**
2. 88.3 ÷ 100 = **0.883 m**
3. 969.5 ÷ 100 = **9.695 m**
4. 60 ÷ 100 = **0.6 m**
5. 7.7 ÷ 100 = **0.077 m**
6. 18 ÷ 1000 = **0.018 km**
7. 616 ÷ 1000 = **0.616 km**
8. 3504 ÷ 1000 = **3.504 km**
9. 9 ÷ 1000 = **0.009 km**
10. 1030 ÷ 1000 = **1.03 km**
11. 97 ÷ 1000 = **0.097 kg**
12. 402 ÷ 1000 = **0.402 kg**
13. 3610 ÷ 1000 = **3.61 kg**
14. 5 ÷ 1000 = **0.005 kg**
15. 890 ÷ 1000 = **0.89 kg**
16. 25 ÷ 1000 = **0.025 *l***
17. 708 ÷ 1000 = **0.708 *l***
18. 60 900 ÷ 1000 = **60.9 *l***
19. 5045 ÷ 1000 = **5.045 *l***
20. 34 010 ÷ 1000 = **34.01 *l***
21. 40 ÷ 100 = 0.4 m
    52 + 0.4 = **52.4 m**
22. 25 ÷ 1000 = 0.025 km
    9 + 0.025 = **9.025 km**
23. 9 ÷ 1000 = 0.009 kg
    8 + 0.009 = **8.009 kg**
24. 200 ÷ 1000 = 0.2 *l*
    98 + 0.2 = **98.2 *l***
25. 35 ÷ 1000 = 0.035 kg
    37 + 0.035 = **37.035 kg**
26. 5 ÷ 1000 = 0.005 *l*
    528 + 0.005 = **528.005 *l***
27. 33 ÷ 100 = 0.33 m
    127 + 0.33 = **127.33 m**
28. 600 ÷ 1000 = 0.6 km
    580 + 0.6 = **580.6 km**

Solve word problems related to decimals and measurements

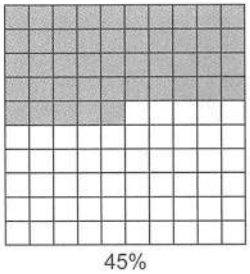
1. \$162.60 ÷ 12 = \$13.55
   Each T-shirt costs **\$13.55.**
2. $\frac{3}{4}$ × 1000 = 750 g = 0.75 kg
   (12.45 × \$30) + (0.75 × \$18) = \$387
   Mrs Matthews spent **\$387** altogether.
3. 79.15 – 16.75 = 62.4 kg
   62.4 ÷ 10 = 6.24 kg
   The mass of each metal ball is **6.24 kg**.
4. (a) $1 - \frac{1}{5} = \frac{4}{5}$
   $\frac{4}{5}$ × 17.3 = 13.84 m
   13.84 ÷ 4 = 3.46 m
   Joey used **3.46 m** of cloth to make one set of curtains.
   (b) 4 × \$19.90 = \$79.60
   She would receive **\$79.60** in all.
5. 

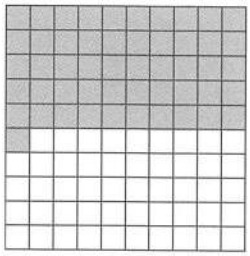
s: sister
u: used
   5 units → 8.6 kg
   1 unit → 8.6 ÷ 5 = 1.72 kg
   3 units → 3 × 1.72 = 5.16 kg
   5.16 – 1.15 = 4.01 kg
   Her sister had **4.01 kg** of sugar left.
6. 6 × \$6.50 = \$39
   3 × \$4.65 = \$13.95
   \$39 + \$13.95 = \$52.95
   The least amount of money that Alex must pay is **\$52.95**.
7. 15 × 5 = 75 kg
   75 × 1000 = 75 000 g
   The total mass of 15 such bags of rice is **75 000 g**.
8. 36 ÷ 9 = 4
   4 × 5.5 = 22 *l*
   22 × 1000 = 22 000 m*l*
   The amount of water she uses to wash each toilet is **22 000 m*l***.
9. 2 × 21.95 = 43.9 km
   3 × 43.9 = 131.7 km
   131.7 × 1000 = 131 700 m
   The total distance he drives per day is **131 700 m**.
10. 6 × 24 = 144
    144 × 390 = 56 160 m*l*
    56 160 ÷ 1000 = 56.16 *l*
    56.16 *l* of drinks are in the big container.
11. 195 ÷ 13 = 15
    175 × 15 = 2625 cm
    2625 ÷ 100 = 26.25 m
    The length of ribbon that she uses to make 175 such bookmarks is **26.25 m**.
12. (a) 255 ÷ 5 = 51
    365 × 51 = 18 615
    The chef makes **18 615** pizzas in a year.
    (b) 18 615 × 175 = 3 257 625 g
    3 257 625 ÷ 1000 = 3257.625 kg
    The chef needs **3257.625 kg** of flour in a year.

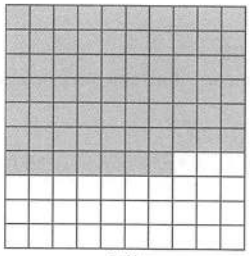
Unit 10: Percentage

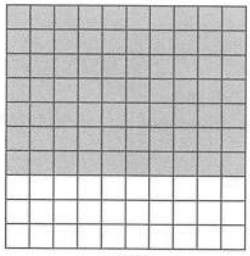
Understand percent

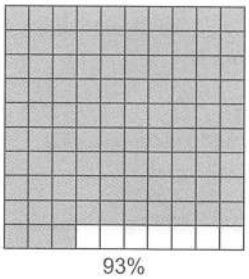
(A) 1. **60, 40**
2. **20, 80**
3. **35, 65**
4. **30, 70**
5. **50, 50**

(B) 1. 
45%

2. 
51%

3. 
67%

4. 
70%

5. 
93%

Convert percentage to decimals or fractions

1. $\frac{20}{100} = 0.2$ $\quad \frac{\cancel{20}^{1}}{\cancel{100}_{5}} = \frac{1}{5}$
2. $\frac{45}{100} = 0.45$ $\quad \frac{\cancel{45}^{9}}{\cancel{100}_{20}} = \frac{9}{20}$
3. $\frac{2}{100} = 0.02$ $\quad \frac{\cancel{2}^{1}}{\cancel{100}_{50}} = \frac{1}{50}$
4. $\frac{89}{100} = 0.89$ $\quad \frac{89}{100} = \frac{89}{100}$
5. $\frac{72}{100} = 0.72$ $\quad \frac{\cancel{72}^{18}}{\cancel{100}_{25}} = \frac{18}{25}$
6. $\frac{5}{100} = 0.05$ $\quad \frac{\cancel{5}^{1}}{\cancel{100}_{20}} = \frac{1}{20}$
7. $\frac{36}{100} = 0.36$ $\quad \frac{\cancel{36}^{9}}{\cancel{100}_{25}} = \frac{9}{25}$
8. $\frac{64}{100} = 0.64$ $\quad \frac{\cancel{64}^{16}}{\cancel{100}_{25}} = \frac{16}{25}$
9. $\frac{98}{100} = 0.98$ $\quad \frac{\cancel{98}^{49}}{\cancel{100}_{50}} = \frac{49}{50}$
10. $\frac{100}{100} = 1$ $\quad \frac{\cancel{100}^{1}}{\cancel{100}_{1}} = 1$

Convert decimals or fractions to percentage

(A) 1. $0.3 = 0.30 = \frac{30}{100} = 30\%$
2. $0.05 = \frac{5}{100} = 5\%$
3. $0.65 = \frac{65}{100} = 65\%$
4. $0.17 = \frac{17}{100} = 17\%$
5. $0.94 = \frac{94}{100} = 94\%$
6. $0.42 = \frac{42}{100} = 42\%$
7. $0.58 = \frac{58}{100} = 58\%$
8. $0.23 = \frac{23}{100} = 23\%$
9. $0.76 = \frac{76}{100} = 76\%$
10. $0.8 = 0.80 = \frac{80}{100} = 80\%$

(B) 1. $\frac{1}{2} = \frac{50}{100} = 50\%$
2. $\frac{9}{10} = \frac{90}{100} = 90\%$
3. $\frac{14}{25} = \frac{56}{100} = 56\%$
4. $\frac{18}{200} = \frac{9}{100} = 9\%$
5. $\frac{240}{400} = \frac{60}{100} = 60\%$
6. $\frac{3}{4} = \frac{75}{100} = 75\%$
7. $\frac{2}{5} = \frac{40}{100} = 40\%$
8. $\frac{11}{20} = \frac{55}{100} = 55\%$
9. $\frac{59}{100} = 59\%$
10. $\frac{350}{500} = \frac{70}{100} = 70\%$

Convert part of a quantity to percentage

1. $\frac{20}{\cancel{100}} \times 150 = 30$
2. $\frac{16}{\cancel{100}} \times 800 = \$128$
3. $\frac{80}{100} \times 55 = 44\text{ kg}$
4. $\frac{35}{100} \times 220 = 77\text{ km}$
5. $\frac{40}{\cancel{100}} \times 3300 = \$1320$
6. $\frac{9}{\cancel{100}} \times 1000 = \$90$
7. $\frac{50}{\cancel{100}} \times 32 = 16\text{ kg}$
8. $\frac{24}{\cancel{100}} \times 400 = 96\ l$

9. $\frac{92}{100} \times 550 =$ **506 cm**

10. $\frac{25}{100} \times 780 =$ **195 m/**

11. $\frac{88}{100} \times 250 =$ **220**

12. $\frac{64}{100} \times 450 =$ **288**

13. $\frac{75}{100} \times 600 =$ **450 m**

14. $\frac{33}{100} \times 1900 =$ **627 g**

15. $\frac{48}{100} \times 325 =$ **156 km**

Calculate percentage based on quantity, and vice versa

1. **57%**
   $100 - 43 = 57$
   $\frac{57}{100} = 57\%$

2. **80%**
   $\frac{8}{10} = \frac{80}{100} = 80\%$

3. **75%**
   $1 - \frac{1}{4} = \frac{3}{4}$
   $\frac{3}{4} \times 100 = 75\%$

4. **50%**
   $\frac{1}{2} \times 300 = 150$
   $\frac{150}{300} \times 100 = 50\%$

5. **40%**
   $600 - 360 = 240$
   $\frac{240}{600} \times 100 = 40\%$

6. **26 students**
   $100 - 35 = 65\%$
   $\frac{65}{100} \times 40 = 40\%$

7. **960 computers**
   $\frac{20}{100} \times 800 = 160$
   $800 + 160 = 960$

8. **$1960**
   $100\% - 20\% = 80\%$
   $\frac{80}{100} \times 2450 = \$1960$

9. **$180**
   $\frac{15}{100} \times 1200 = \$180$

10. **$180**
    $\frac{4.5}{100} \times 4000 = \$180$

Solve word problems related to percentage

1. $\frac{20}{100} \times 900 = \$180$
   $\$900 - \$180 = \$720$
   Ronnie paid **$720** for the bicycle.

2. (a) $100 - 35 - 25 = 40\%$
   Charlie received **40%** of the beads.

   (b) $40\% \rightarrow 600$
   $1\% \rightarrow 600 \div 40 = 15$
   $35\% \rightarrow 35 \times 15 = 525$
   Nancy received **525** beads.

3. $100 - 45 - 20 = 35\%$
   $\frac{35}{100} \times 80 = 28$
   The shopkeeper had **28 kg** of rice left.

4. $\frac{7}{100} \times 375 = \$26.25$
   $\$375 + \$26.25 = \$401.25$
   The total cost of the dinner was **$401.25**.

5. (a) $100 - 40 = 60\%$
   $60\% \rightarrow 48$
   $10\% \rightarrow 8$
   $100\% \rightarrow 10 \times 8 = 80$
   There are **80** blue pens.

   (b) $100 - 25 - 35 = 40\%$
   $40\% \rightarrow 80$
   $10\% \rightarrow 80 \div 4 = 20$
   $100\% \rightarrow 10 \times 20 = 200$
   There are **200** pens altogether in the box.

6. (a) $100 - 60 = 40\%$
   $60 - 40 = 20\%$
   The percentage difference between the chicken eggs and duck eggs is **20%**.

   (b) $20\% \rightarrow 420$
   $40\% \rightarrow 2 \times 420 = 840$
   The farmer has **840** duck eggs.

   (c) $840 + 420 = 1260$
   $(1260 \times 15¢) + (840 \times 23¢) = 38\,220¢$
   $= \$382.20$
   The farmer collects **$382.20**.

7. (a) $\frac{15}{100} \times 890 = \$133.50$
   $\$890 - \$133.50 = \$756.50$
   The portable DVD player was **$756.50** after the discount.

   (b) $\$756.50 \div 5 = \$151.30$
   She paid **$151.30** each month.

8. (a) $\frac{45}{100} \times 250\,000 = \$112\,500$
   His wife received **$112 500**.

   (b) $\frac{33}{100} \times 250\,000 = \$82\,500$
   His son received **$82 500**.

   (c) $\$250\,000 - \$112\,500 - \$82\,500 = \$55\,000$
   $\$55\,000 \div 2 = \$27\,500$
   Each of his daughters received **$27 500**.

Unit 11: Average

Understand the concept of average

1. (a) $\$15 + \$18 + \$60 =$ **$93**
   (b) $\$93 \div 3 =$ **$31**

2. (a) $268 + 208 + 109 =$ **585 kg**
   (b) $585 \div 3 =$ **195 kg**

3. (a) $147 + 96 + 114 =$ **357 m/**
   (b) $357 \div 3 =$ **119 m/**

4. (a) $35 + 81 + 66 + 94 =$ **276 cm**
   (b) $276 \div 4 =$ **69 cm**

5. (a) 358 + 92 + 189 + 93 = **732 l**
   (b) 732 ÷ 4 = **183 l**
6. (a) 293 + 158 + 431 + 126 = **1008 m**
   (b) 1008 ÷ 4 = **252 m**

Calculate average

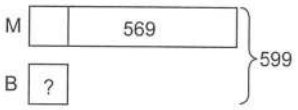
1. 6 + 9 + 15 = 30
   30 ÷ 3 = **10**
2. 1 + 11 + 21 = 33
   33 ÷ 3 = **11**
3. 48.7 + 99.3 + 132.5 = 280.5 km
   280.5 ÷ 3 = **93.5 km**
4. 268 + 804 + 539 = 1611 g
   1611 ÷ 3 = **537 g**
5. $3.50 + $6.05 + $11 = $20.55
   $20.55 ÷ 3 = **$6.85**
6. 14 + 56 + 73 + 105 = 248
   248 ÷ 4 = **62**
7. 64 + 120 + 96 + 48 = 428
   428 ÷ 4 = **107**
8. 15.5 + 8.7 + 5.3 + 3.9 = 33.4 l
   33.4 ÷ 4 = **8.35 l**
9. 24.3 + 36.16 + 58.9 + 70.24 = 189.6 m
   189.6 ÷ 4 = **47.4 m**
10. 6.175 + 8.23 + 11.205 + 14.19 = 39.8 kg
    39.8 ÷ 4 = **9.95 kg**
11. 10 + 20 + 30 + 40 + 50 = 150
    150 ÷ 5 = **30**
12. 9 + 18 + 36 + 72 + 126 = 261
    261 ÷ 5 = **52.2**
13. $2.40 + $4.90 + $7.80 + $10.10 + $12.30 = $37.50
    $37.50 ÷ 5 = **$7.50**
14. 0.75 + 1.4 + 3.36 + 9.6 + 21.09 = 36.2 kg
    36.2 ÷ 5 = **7.24 kg**
15. 46 + 52 + 84 + 93 + 106 = 381 min
    381 ÷ 5 = **76.2 min**
16. 7 + 8 + 10 + 65 + 121 + 143 = 354
    354 ÷ 6 = **59**
17. 45 + 87 + 132 + 190 + 216 + 248 = 918
    918 ÷ 6 = **153**
18. 4.4 + 5.35 + 9.8 + 13.02 + 17.1 + 20.53 = 70.2
    70.2 ÷ 6 = **11.7 m**
19. 0.17 + 2.035 + 6.44 + 7.952 + 11.26 + 14.599 = 42.456 l
    42.456 ÷ 6 = **7.076 l**
20. 55.08 + 67.474 + 92.23 + 101.995 + 124.76 + 178.507
    = 620.046 km
    620.046 ÷ 6 = **103.341 km**

Calculate total number based on average and number of items given

1. 17 × 3 = **51**
2. 154.4 × 3 = **463.2**
3. 68 × 4 = **272**
4. 103.2 × 4 = **412.8**
5. 10.5 × 5 = **52.5**
6. 131.69 × 5 = **658.45**
7. 23.46 × 6 = **140.76**
8. 150.783 × 6 = **904.698**

Solve word problems related to average

1. $200 + $180 + $280 + $300 + $265 = $1225
   $1225 ÷ 5 = $245
   The average amount of money Alan had saved over this period of time was **$245**.
2. 146.5 × 4 = 586 cm
   145 + 152 + 150 = 447 cm
   586 – 447 = 139 cm
   Daniel's height is **139 cm**.
3. (a) 72 + 85 + 70 + 79 = 306
   The total marks of the four subjects is **306**.
   (b) 306 ÷ 4 = 76.5
   The average marks of the four subjects is **76.5**.
4. 369 × 5 = 1845
   1845 – (608 + 411 + 227) = 599

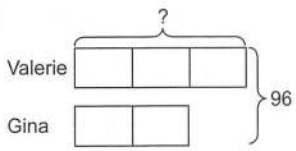


M : Motorcycles
B : Bicycles

   599 – 569 = 30
   30 ÷ 2 = 15
   The number of bicycles that passed by the shop that day was **15**.
5. 4 × 24.5 = 98
   16 + 47 + 25 = 88
   98 – 88 = 10
   The last number is **10**.
6. 7 × 329 = 2303
   5 × 250 = 1250
   2303 – 1250 = 1053
   1053 cans of drinks were sold during the last two days.
7. 12.8 kg = 12 800 g
   12 800 – 800 = 12 000 g
   12 000 ÷ 160 = 75
   There are **75** pens in the box.
8. 22 × 90 = 1980¢ = $19.80
   $27 + $19.80 = $46.80
   $46.80 ÷ (22 + 18) = $1.17
   The average pocket money of all the students in the class is **$1.17**.
9. (1 + 20) × 10 = 210
   210 ÷ 20 = 10.5
   The average of all the whole numbers ranging from 1 to 20 is **10.5**.
10. 8450 – 5250 = 3200 g
    3200 ÷ 200 = 16
    The number of red apples in the box is **16**.
11. (a) 10 × 47 = 470
    470 – 326 = 144
    453 – 144 = 309
    The number of blue pens Uncle Ron had left was **309**.

(b) 309 + 471 = 780
780 ÷ 15 = 52
There were **52** blue pens in each box.

12. (a)



48 × 2 = 96
96 ÷ 4 = 24
3 × 24 = 72
Valerie has **72** stickers.

(b) 41 × 2 = 82
82 – 24 = 58
Mary has **58** more stickers than Gina.

Review 4 (Questions available online.)

1. **(1)**
0.037 × 1000 = 37 m
10.037 km = 10 km 37 m

2. **(1)**
8 ÷ 1000 = 0.008

3. **(2)**
56.5 × 600 = 56.5 × 6 × 100 = 339 × 100 = 33 900

4. **(2)**
49.7 ÷ 100 = 0.497 m

5. **(2)**
25 × 800 = 20 000 g
20 000 ÷ 1000 = 20 kg

6. **(1)**
\$16.80 ÷ 14 = \$1.20

7. **(1)**
\$585 ÷ 6 = \$97.5
\$97.5 ÷ 10 = \$9.75

8. **(3)**
$\frac{64}{400} = \frac{16}{100} = 16\%$

9. **(2)**
\$815 ÷ 5 = \$163

10. **(1)**
$0.03 = \frac{3}{100} = 3\%$

11. **(3)**
32 × 72 = 2304

12. **(3)**
100 – 10 = 90%
90% → 180
10% → 180 ÷ 9 = 20
100% → 20 × 10 = 200

13. **(2)**
$\left(\frac{7}{100} \times \$20\right) + \left(\frac{60}{100} \times \$3\right) = \$3.20$

14. **(4)**
$\frac{20}{100} \times 3 = \frac{3}{5}$ m $\frac{10}{100} \times 6 = \frac{3}{5}$ m
$\frac{5}{100} \times 12 = \frac{3}{5}$ m $\frac{25}{100} \times 2 = \frac{1}{2}$ m

15. (a) **470.5 *l***
500 ÷ 1000 = 0.5 *l*
470 + 0.5 = 470.5 *l*

(b) **58.068 km**
68 ÷ 1000 = 0.068 km
58 + 0.068 = 58.068 km

16. **1.212**
4848 ÷ 4000 = 4848 ÷ 4 ÷ 1000 = 1212 ÷ 1000 = 1.212

17. (a) **13 405 g**
13.405 × 1000 = 13 405 g

(b) **61.7 cm**
0.617 × 100 = 61.7 cm

18. **3540**
7.08 × 5 × 100 = 35.4 × 100
= 3540

19. **0.525 m**
(22 – 4 – 4) ÷ 2 = 7
7 × 7.5 = 52.5 cm
52.5 ÷ 100 = 0.525 m

20. **0.197**
197 000 ÷ 1000 = 197
197 ÷ 100 = 1.97
1.97 ÷ 10 = 0.197

21. **0.12**
A × 7 × 10 = 8.4
A = 8.4 ÷ 7 ÷ 10
A = 0.12

22. **40 people**
\$19 260 ÷ \$481.50 = 40

23. $\frac{12}{25}$
$\frac{48}{100} = \frac{12}{25}$

24. **20%**
192 + 48 = 240
$\frac{48}{240} \times 100 = 20\%$

25. **169.5 cm**
15 + 162 = 177 cm
162 + 177 = 339 cm
339 ÷ 2 = 169.5 cm

26. **1.64 m**
(6 × 1.6) – (4 × 1.58) = 3.28 m
3.28 ÷ 2 = 1.64 m

27. **60%**
$1 - \frac{2}{5} = \frac{3}{5}$
$\frac{3}{\cancel{5}_{1}} \times \cancel{100}^{20} = 60\%$

28. **\$346.50**
$\left(\frac{20}{100} \times 315\right) + 315 = \$378$
(\$315 + \$378) ÷ 2 = \$346.50

29. **1400 g**
100 – 65 = 35%
$\frac{35}{\cancel{100}} \times 4\cancel{000} = 1400$ g

30. **31.7**
6 × 8.9 = 53.4
6.5 + 3.8 + 4.1 + 7.3 = 21.7
53.4 – 21.7 = 31.7

31. 24 × 330 = 7920 m*l*
7920 ÷ 1000 = 7.92 *l*
The total amount of mineral water in a carton was **7.92 *l***.

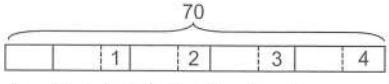
32. 1000 × $3.30 = $3300
80 × $4.20 = $336
$3300 + $336 = $3636
Mr Jones paid **$3636** for all the lunchboxes.

33. (a) 500 ÷ 20 = 25
There are **25** packs of frozen chicken wings.
(b) 3 × $15.55 = $46.65
She pays **$46.65**.

34. 12 × 0.85 = 10.2 *l*
7 × 0.75 = 5.25 *l*
10.2 – 5.25 = 4.95 *l* = 4950 m*l*
4950 m*l* of milk are left after a week.

35. (a) (8 × 0.4) + (5 × 0.4) = 5.2 km
5.2 × 1000 = 5200 m
The total distance both boys have run is **5200 m**.
(b) 8 – 5 = 3
3 × 0.4 = 1.2 km
Zachary has run a distance **1.2 km** longer than Andy.

36. (a) (63 + 74) ÷ 2 = 68.5
68.5 – 4 = 64.5
The average mark of Maggie's Maths and Science examinations was **64.5**.
(b) 64.5 × 2 = 129
129 – 55 = 74
Maggie got **74** marks for her Maths examination.

37. 

5 parts + 1 + 2 + 3 + 4 = 5 × 14
5 parts + 10 = 70
5 parts = 70 – 10
1 part = 60 ÷ 5
= 12
12 + 13 + 14 + 15 + 16 = 70
The five numbers are **12**, **13**, **14**, **15** and **16**.

38. (a) $\frac{35}{100}$ × 4600 = 1610
4600 – 1610 – 920 = 2070
The factory produces **2070** dresses.
(b) $\frac{2070}{4600}$ × 100 = 45
45% of these clothing are dresses.

39. (a) 120% → $10.20
1% → 10.20 ÷ 120 = $0.085
100% → 100 × 0.085 = $8.50
His normal hourly wage is **$8.50**.
(b) ($8.50 × 8) + $10.20 = $78.20
He earns **$78.20** that day.

40. $\frac{3}{100}$ × 1200 = $36
$1200 + $36 = $1236
Christine will have **$1236** in her savings account at the end of this year.

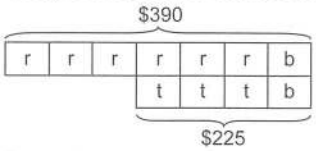
Non-Routine Questions 2 (Questions available online.)

1. 4 × 4.4 = 17.6
Let the smallest number be A.
A + (A + 1.1) + (A + 2.2) + (A + 3.3) = 17.6
4A = 17.6 – 6.6
A = 11 ÷ 4
= 2.75
The smallest number is **2.75**.

2. Find the common multiples of 2, 3 and 6.
Common multiples
2: 2 , 4 , (6), 8 , 10 , (12), 14 , 16 , (18), ...
3: 3 , (6), 9 , (12), 15 , (18), ...
6: (6), (12), (18), 24 , ...
The common multiples of 2, 3 and 6 are 6, 12, 18, ...
The possible values of Y are:
6 + 1 = 7
12 + 1 = 13
18 + 1 = 19
The possible values of Y are **7**, **13** and **19**.

3. Let's analyse the possibilities of all digits.
First digit: 9
Second digit: 2, 4, 6, or 8
Third digit: 1, 3, 5 or 7
Last digit: 60% of 1 = 0.6 (not possible)
60% of 3 = 1.8 (not possible)
60% of 5 = 3
60% of 7 = 4.2 (not possible)
Hence, the 4 digits should be 9 4 5 3.
Let's check if the sum is 21.
9 + 4 + 5 + 3 = 21
I am **9453.**

4. All multiples of 6 are also multiples of 3.
Multiples of 6 between 70 and 100 = 72, 78, 84, 90 and 96
Possible values of X = 73, 79, 85, 91 and 97
The greatest possible value of X is **97**.

5. 

r : racquet
b : basketball
$390 – $225 = $165
$165 ÷ 3 = $55
A tennis racquet cost $55.
$225 – (3 × $55) = $60
A basketball cost $60.
$60 + $55 = $115
A tennis racquet and basketball cost **$115**.

6. Let's analyse the possibilities of the third and fourth digits.
Third digit: 4, 5, 6
Fourth digit: 7, 8, 9
Use 'Guess and Check' method,
(8 + 3 + [4] + [7] + 6 + 5) ÷ 5 = 6 R 3
(8 + 3 + [5] + [8] + 6 + 5) ÷ 5 = 7
(8 + 3 + [6] + [9] + 6 + 5) ÷ 5 = 7 R 2
(8 + 3 + [4] + [7] + 6 + 5) ÷ 6 = 5 R 3
The code is **8 3 4 7 6 5**.

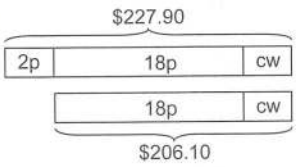
7. Multiples of 6 between 40 and 60: 42, 48, 54
Multiples of 8 between 40 and 60: 48, 56
Multiple of 12 between 40 and 60: 48
Common multiple of 6, 8 and 12 between 40 and 60 = 48
Joyce bought **48** sweets.

8. Let's analyse the possibilities of the first and last digits.
The last digit must be 0.
The first digit can only be 6 or 8.
In order to adhere to rules (a) to (d) and (f), the possible 7-digit numbers are: 8326490, 8329460, 8346290 and 8349260
Test each of the possible 7-digit numbers to see if it adheres to rule (e). Only 8326490 adheres to rule (e).
Hence, the 7-digit number is **8326490**.

9. Z ÷ 5 = quotient
quotient + 3 = 24
quotient – 3 = 18
∴ quotient = 24 – 3 = 18 + 3 = 21
Z ÷ 5 = 21
Z = 21 × 5 = 105
Number Z is **105**.

10. By working backwards, percentage of orange juice consumed by her children
$= \frac{11}{10} \times 30\% + 30\%$
= 63%
Percentage of orange juice left = 100% – 30% – 63%
= 7%
7% → 315 m*l*
1% → 315 ÷ 7 = 45 m*l*
100% → 45 × 100 = 4500 m*l*
Aunt Eunice made **4500 m*l*** of orange juice.

11. First number = A
Second number $= \frac{2}{5}A + A$
$= 1\frac{2}{5}A$
Third number $= \left(\frac{2}{5} \times 1\frac{2}{5}A\right) + 1\frac{2}{5}A$
$= \frac{14}{25}A + 1\frac{2}{5}A$
$= 1\frac{24}{25}A$
$A + 1\frac{2}{5}A + 1\frac{24}{25}A = 36\frac{1}{3} \times 3 = 109$
$4\frac{9}{25}A = 109$
$A = 109 \div 4\frac{9}{25}$
$A = 109 \div \frac{109}{25}$
$A = \cancel{109} \times \frac{25}{\cancel{109}}$
$A = 25$
$1\frac{24}{25} \times 25 = \frac{49}{\cancel{25}} \times \cancel{25}$
= 49
The largest number is **49**.

12. 

p: pizza
cw: chicken wings
2p = $227.90 – $206.10 = $21.80
p = $21.80 ÷ 2 = $10.90
cw = $206.10 – (18 × $10.90) = $9.90
(4 × $10.90) + (4 × $9.90) = $83.20
4 pizzas and 4 boxes of chicken wings cost **$83.20**.

Unit 12: Rate

Understand rate

1. **3.13, 1**
1, 1, 3.13
0.32
2. **100, 70.40**
1, 70.40, 100, 0.704
24, 24, 0.704, 16.90
3. **3, 450**
1, 450, 3
150
5, 5, 150
750
4. **120, 480**
1, 480, 120
4
48, 4, 48
192
5. **50, 1**
1, 1, 50
0.02
2000, 2000, 0.02
40

Solve word problems related to rate

1. 1 h 40 min = 100 min
100 min → 5500 words
1 min → 5500 ÷ 100
= 55 words
His typing speed is **55 words per minute**.

2. 1 h → $8.50
8 h (1 day) → 8 × $8.50
= $68
6 days → 6 × $68
= $408
He will be paid **$408**.

3. 1 min → 120 m
20 min → 120 × 20
= 2400 m
2400 ÷ 400 = 6
He will cover **6 laps** around the track.

4. 60 min → 16 km
1 min → 16 ÷ 60 = $\frac{4}{15}$ km
36 min → $\frac{4}{15} \times 36 = 9\frac{3}{5}$ km
She will cycle $\mathbf{9\frac{3}{5}}$ **km**.

5. 1 letter → 25¢
25 letters → 25 × 25
= 625¢
= $6.25
It will cost him **$6.25**.

6. 250 g → 1 muffin
1 g → $\frac{1}{25}$ muffin
2100 g → $\frac{1}{250} \times 2100$
$= \frac{2100}{250}$
= 8.4
She can bake **8 full muffins**.

7. 1 s → 35 m*l*
180 s → 180 × 35
= 6300 m*l*
= 6 *l* 300 m*l*
6 *l* 300 m*l* of water has leaked from the tap after 3 minutes.

8. $4\frac{1}{2}$ min → 18 *l*
1 min → 18 ÷ $4\frac{1}{2}$
= 4 *l*
The rate of the water pump is **4 *l*/min**.

9. 5 *l* → 75 km
1 *l* → 75 ÷ 5 = 15 km
The lorry can travel **15 km** on 1 *l* of petrol.

10. 200 m^2 → \$80
1 m^2 → $\frac{80}{200}$
700 m^2 → $\frac{80}{200}$ × 700 = \$280
It will cost **\$280** to paint an area of 700 m^2.

Unit 13: Angles

Recognise and understand angles on a straight line, angles at a point and vertically opposite angles

(A) 1. ∠t = **80°**
∠u = **100°**
∠t + ∠u = 80° + 100° = **180°**

2. ∠p = **35°**
∠q = **145°**
∠p + ∠q = 35° + 145° = **180°**

3. ∠c = **60°**
∠d = **60°**
∠e = **60°**
∠c + ∠d + ∠e = 60° + 60° + 60° = **180°**

4. ∠l = **78°**
∠m = **18°**
∠n = **84°**
∠l + ∠m + ∠n = 78° + 18° + 84° = **180°**

5. ∠w = **19°**
∠x = **34°**
∠y = **102°**
∠z = **25°**
∠w + ∠x + ∠y + ∠z = 19° + 34° + 102° + 25° = **180°**

6. ∠f = **40°**
∠b = **90°**
∠h = **22°**
∠i = **28°**
∠f + ∠g + ∠h + ∠i = 40° + 90° + 22° + 28° = **180°**

7. ∠x = **114°**
∠y = **246°**
∠x + ∠y = 114° + 246° = **360°**

8. ∠a = **318°**
∠b = **42°**
∠a + ∠b = 318° + 42° = **360°**

9. ∠h = **135°**
∠i = **90°**
∠j = **135°**
∠h + ∠i + ∠j = 135° + 90° + 135° = **360°**

10. ∠u = **47°**
∠v = **210°**
∠w = **103°**
∠u + ∠v + ∠w = 47° + 210° + 103° = **360°**

11. ∠p = **6°**
∠q = **57°**
∠r = **163°**
∠s = **134°**
∠p + ∠q + ∠r + ∠s = 6° + 57° + 163° + 134° = **360°**

12. ∠m = **60°**
∠n = **70°**
∠o = **80°**
∠p = **150°**
∠m + ∠n + ∠o + ∠p = 60° + 70° + 80° + 150° = **360°**

13. ∠e = **75°**
∠f = **105°**
∠g = **75°**
∠h = **105°**
e, g
f, h

14. ∠s = **154°**
∠t = **26°**
∠u = **154°**
∠v = **26°**
s, u
t, v

(B) 1. (a) ∠a = **75°** ∠c = **75°**
∠b = **105°** ∠d = **105°**
(b) **vertically opposite**
(c) **vertically opposite**
(d) **angles on a straight line**
(e) **angles at a point**

2. (a) **180°** (angles on a str. line)
(b) ∠**a**, ∠**b** and ∠**c** or ∠**d** and ∠**e**
(c) ∠**b** and ∠**c**
(d) 360° – 90° = **270°** (angles at a point)

Use angle properties to find unknown angles

1. ∠AOC = 180° – 28° = **152°** (angles on a str. line)
∠DOB = ∠AOC = **152°** (vertically opposite angles)
∠COB = ∠AOD = **28°** (vertically opposite angles)

2. ∠WOY = 180° – 118° – 25°
= **37°** (angles on a str. line)

3. ∠DOE = 180° – 77° – 45° – 18°
= **40°** (angles on a str. line)

4. ∠SOV = 180° – 90° – 69°
= **21°** (angles on a str. line)

5. ∠AOB = 360° – 96°
= **264°** (angles at a point)

6. ∠a = 360° – 122° – 58° – 101°
= **79°** (angles at a point)

7. ∠e = 360° – 194° – 90°
= **76°** (angles at a point)

8. ∠x = 360° – 112° – 87° – 93°
= **68°** (angles at a point)

9. ∠y = (180° – 90°) ÷ 2
= **45°** (angles on a str. line)

10. ∠b + ∠4b = 360° – 90° – 90° (angles at a point)
∠5b = 180°
∠b = 180° ÷ 5 = **36°**
∠4b = 4 × 36° = **144°**

11. $\angle m = 180° - 125° - 45°$
$= \mathbf{10°}$ (angles on a str. line)

12. $\angle 2p + \angle p = 360° - 200° - 88°$
$\angle 3p = 72°$ (angles at a point)
$\angle p = 72° \div 3 = \mathbf{24°}$
$\angle 2p = 2 \times 24° = \mathbf{48°}$

Review 5 (Questions available online.)

1. **(3)**
2. **(4)**
3. **(3)**
$1 SGD = €0.66 EUR
$15 SGD = 15 × 0.66
= €9.90 EUR

4. **(3)**
€0.66 EUR = $1 SGD
€1 EUR = $\$\frac{1}{0.66}$ SGD
€25 EUR = $25 \times \frac{1}{0.66}$
≈ 37.88 SGD

5. **(4)**
1 min → 240 items
60 min → 60 × 240
= 14 400 items

6. **(3)**
$\angle p = 180° - 35° = 145°$ ($\angle$s on a str. line)

7. **(4)**
$\angle q = 180° - 90° - 35° = 55°$ ($\angle$s on a str. line)
$\angle p + \angle q = 145° + 55° = 200°$

8. **20°**
$a + 2a + 3a + 60° = 180°$ ($\angle$s on a str. line)
$6a = 120°$
$a = 20°$

9. **46°**
$b + 103° = 2b + 80°$ (vertically opp. $\angle$s)
$b = 23°$
$2b = 46°$

10. **50°**
$3c + 2c = 360° - 90° - 20°$
$5c = 250°$
$c = 250° \div 5$
$= 50°$

11. **$112.50**
8 am to 5 pm → 9 h
1 h → $12.50
9 h → 9 × $12.50
= $112.50

12. **$1350**
$112.50 × 6 × 2 = $1350

13. **105°**
$\angle EOF = 60°$ $\angle AOB = 45°$
$\angle EOF + \angle AOB = 60° + 45° = 105°$

14. $\mathbf{81\frac{1}{4}\ m^2}$
8 l → 650 m^2
1 l → $\frac{650}{8} = 81\frac{1}{4}\ m^2$

15. **160°**
$4b + 3b + 2b = 360°$ ($\angle$s at a point)
$9b = 360°$
$b = 360° \div 9 = 40°$
$4b = 4 \times 40° = 160°$

16. **115°**
$\angle a = 180° - 18° - 57° - 33°$
$= 72°$ ($\angle$s on a str. line)
$\angle c = 180° - 57° - 33° - 47°$
$= 43°$ ($\angle$s on a str. line)
$\angle a + \angle c = 72° + 43°$
$= 115°$

17. **$6.90**
first km → $3.60
next 6 km → 6 × $0.55 = $3.30
total → $3.60 + $3.30 = $6.90

18. **$8.65**
first km → $3.60
next 7 km → 7 × $0.55 = $3.85
last 1200 m → 4 × $0.30 = $1.20
total → $3.60 + $3.85 + $1.20 = $8.65

19. **60 items**
3 min → 18 items
1 min → 18 ÷ 3 = 6 items
10 min → 6 × 10 = 60 items

20. **90 min**
18 items → 3 min
1 item → $\frac{3}{18}$ min
540 items → $\frac{3}{18} \times 540 = 90$ min

Unit 14: Triangles

Classify triangles

(A) 1. **Isosceles**
2. **Isosceles**
3. **Equilateral**
4. **Equilateral**
5. **Isosceles**

(B) 1. **Right**
2. **Obtuse**
3. **Acute**
4. **Acute**
5. **Obtuse**

Recognise and find unknown angles in different triangles: right-angled, isosceles and equilateral triangles

(A) 1. $\angle ABC = 180° - 58° - 63° = \mathbf{59°}$
(sum of $\angle$s in a triangle = 180°)

2. $\angle NLM = 180° - 116° - 25° = \mathbf{39°}$
(sum of $\angle$s in a triangle = 180°)

3. $\angle EFD = 180° - 40° - 55° = \mathbf{85°}$
(sum of $\angle$s in a triangle = 180°)

4. $\angle YXZ = 90° - 49° = \mathbf{41°}$
(sum of non-right $\angle$s in a right-angled triangle = 90°)

5. $\angle IGH = 90° - 28° = \mathbf{62°}$
(sum of non-right $\angle$s in a right-angled triangle = 90°)

6. $\angle QOP = 90° - 69° = \mathbf{21°}$
(sum of non-right $\angle$s in a right-angled triangle = 90°)
7. $\angle RST = \mathbf{72°}$
($\angle$s opposite equal sides of isosceles triangle are equal)
8. $\angle UVW = 180° - (2 \times 23°) = \mathbf{134°}$
($\angle$s opposite equal sides of isosceles triangle are equal)
9. $\angle YXZ = (180° - 18°) \div 2 = \mathbf{81°}$
($\angle$s opposite equal sides of isosceles triangle are equal)
10. $\angle ACB = \mathbf{60°}$
(all $\angle$s in an equilateral triangle are 60°)

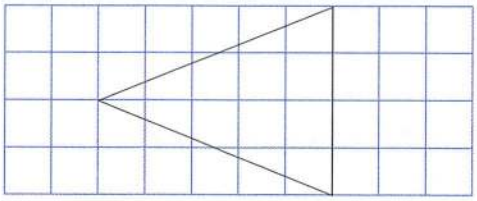
(B) 1. $\angle ACB = (180° - 42°) \div 2$
$= \mathbf{69°}$ (isosceles triangle)
2. $\angle EHF = \angle EFH = 180° - 59° - 53°$
$= \mathbf{68°}$ (isosceles triangle)
3. $\angle RPQ = \angle PRQ = 60°$ (equilateral triangle)
$\angle RPS = 60° - 24° = 36°$
$\angle PSR = 180° - 36° - 60° = \mathbf{84°}$
(sum of $\angle$s in a triangle = 180°)
4. $\angle DCB = \angle DBC$
$= 31°$ (isosceles triangle)
$\angle CDB = 180° - 31° - 31° = 118°$
(sum of $\angle$s in a triangle = 180°)
$\angle ADC = 180° - 118°$
$= \mathbf{62°}$ (angles on a str. line)
5. $\angle PRQ = 60°$ (equilateral triangle)
$\angle PRS = 124° - 60° = 64°$
$\angle SPR = 180° - 90° - 64° = \mathbf{26°}$
(sum of $\angle$s in a triangle = 180°)
6. $\angle ABC = (180° - 124°) \div 2$
$= 28°$ (isosceles triangle)
$\angle EBD = 180° - 90° - 59° = 31°$
(sum of $\angle$s in a triangle = 180°)
$\angle ABD = 28° + 31° = \mathbf{59°}$

(C) 1. $\angle a = 180° - 110° - 35° = \mathbf{35°}$
(sum of $\angle$s in a triangle = 180°)
It is an **isosceles** triangle.
2. $\angle b = 180° - 60° - 60° = \mathbf{60°}$
(sum of $\angle$s in a triangle = 180°)
It is an **equilateral** triangle.
3. $\angle c = 180° - 70° - 30° = \mathbf{80°}$
(sum of $\angle$s in a triangle = 180°)
4. $\angle d = 180° - 25° - 65° = \mathbf{90°}$
(sum of $\angle$s in a triangle = 180°)
It is a **right-angled** triangle.
5. $\angle e = 180° - 65° - 50° = \mathbf{65°}$
(sum of $\angle$s in a triangle = 180°)
It is an **isosceles** triangle.
6. $\angle f = 180° - 130° - 15° = \mathbf{35°}$
(sum of $\angle$s in a triangle = 180°)

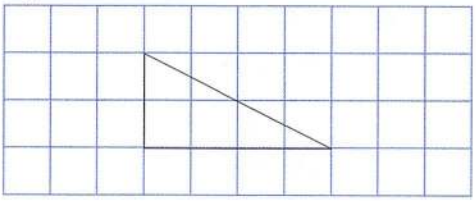
Draw triangles

(Accept all possible answers.)

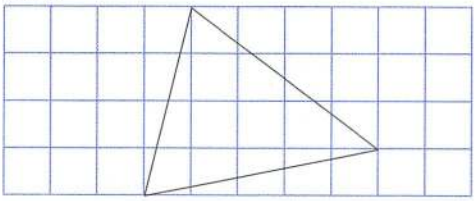
(A) 1. Isosceles



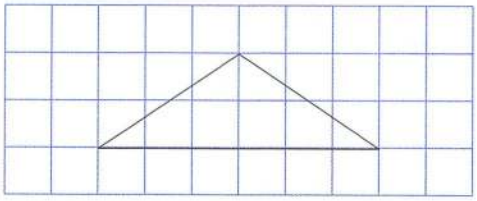
2. Right



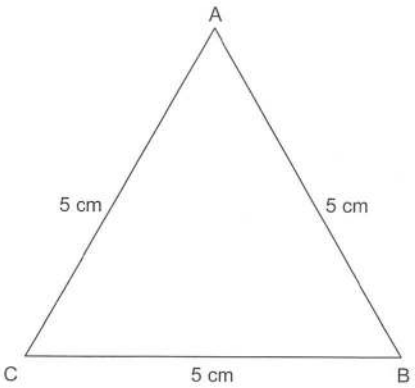
3. Acute



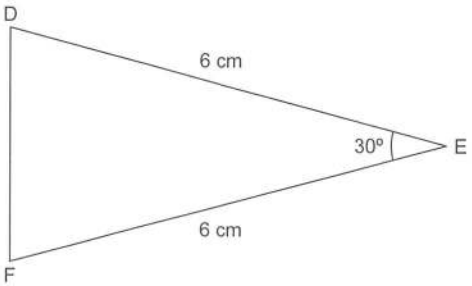
4. Obtuse



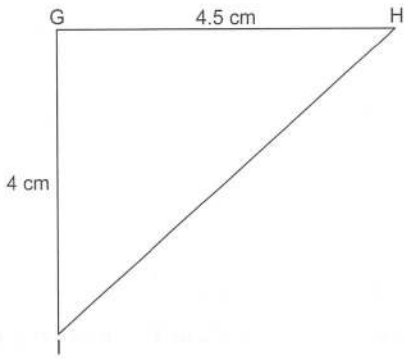
(B) 1.



2.



3.



Unit 15: Quadrilaterals

Classify quadrilaterals

1. **Trapezium**
2. **Parallelogram**
3. **Rhombus**
4. **Trapezium**
5. **Parallelogram**

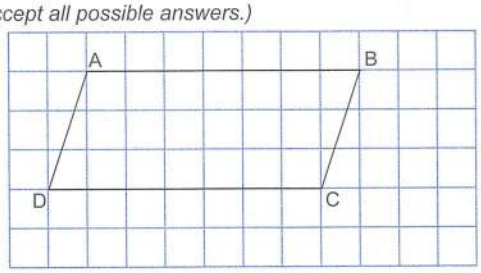
Recognise and find unknown angles in a parallelogram, rhombus and trapezium

1. ∠a = **110°** (opp. ∠s of a parallelogram are equal)
2. ∠b = 180° – 60° = **120°**
   (∠s between parallel sides add up to 180°)
3. ∠WZY = ∠WXY = **70°**
   (opp. ∠s of a parallelogram are equal)
   ∠c = 180° – 70° – 70° = **40°**
   (sum of ∠s in a triangle = 180°)
4. ∠d = **135°**
   (opp. ∠s of a parallelogram are equal)
5. ∠e = 180° – 123° = **57°**
   (∠s between parallel sides add up to 180°)
   ∠f = 180° – 98° = **82°**
   (∠s between parallel sides add up to 180°)
6. ∠PSR = 180° – 38° = 142°
   (∠s between parallel sides add up to 180°)
   ∠g = 142° – 40° = **102°**
7. ∠TRU = (180° – 70°) ÷ 2 = 55° (isosceles triangle)
   ∠SRU = 180° – 90° = 90°
   (∠s between parallel sides add up to 180°)
   ∠h = 90° – 55° = **35°**
8. ∠BAC = 35° (isosceles triangle)
   ∠i = 180° – 35° – 35° = **110°**
   (sum of ∠s in a triangle = 180°)
9. ∠j = 180° – 105° = **75°**
   (∠s between parallel sides add up to 180°)
10. ∠JNM = 180° ÷ 3 = 60° (equilateral triangle)
    ∠JNL = 180° – 60° = 120° (∠s on a str. line)
    ∠ k = **120°** (opp. ∠s of a rhombus are equal)
11. ∠PSR = 180° – 82° = **98°**
    (∠s between parallel sides add up to 180°)
12. ∠BAD = ∠DCB = 118°
    (opp. ∠s of a parallelogram are equal)
    ∠ACD = 118° – 68° = **50°**
13. ∠WXZ = 180° – 90° – 61° = **29°**
    (sum of ∠s in a triangle = 180°)
    ∠WZY = ∠WXY = 90° + 29° = 119°
    (opp. ∠s of a parallelogram are equal)
    ∠XZY = 119° – 90° = **29°**
    ∠XYZ = 180° – 90° – 29° = **61°**
    (sum of ∠s in a triangle = 180°)
14. ∠CAD = 180° – 68° – 56° = **56°**
    (∠s between parallel sides add up to 180°)
15. ∠PQR = ∠POR = 70°
    (opp. ∠s of a parallelogram are equal)
    ∠PQS = 70° – 32° = **38°**
    ∠ORQ = 180° – 70° = 110°
    (∠s between parallel sides add up to 180°)
    ∠ORP = 180° – 47° – 70° = 63°
    (sum of ∠s in a triangle = 180°)
    ∠QRS = 110° – 63° = **47°**
16. ∠ZWX = ∠ZYX = 115°
    (opp. ∠s of a parallelogram are equal)
    ∠YWX = 115° – 70° = **45°**
    ∠ZXY = 180° – 115° – 30° = 35°
    (sum of ∠s in a triangle = 180°)
    ∠WXY = 180° – 115° = 65°
    (∠s between parallel sides add up to 180°)
    ∠WXZ = 65° – 35° = **30°**

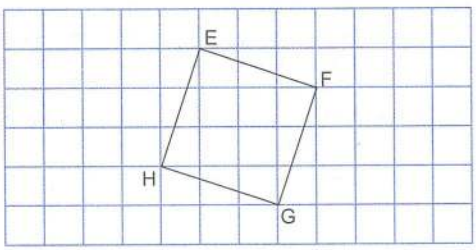
Draw quadrilaterals

(Accept all possible answers.)

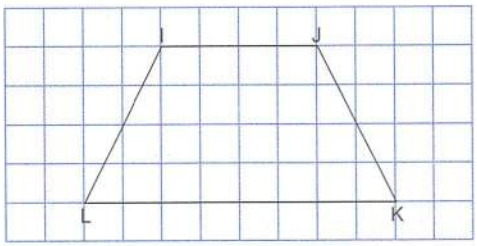
1.



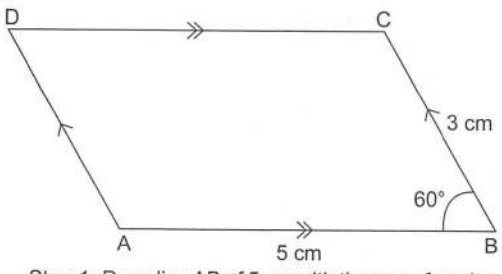
2.



3.

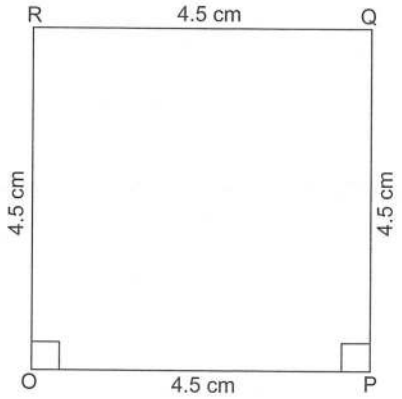


(B) 1.



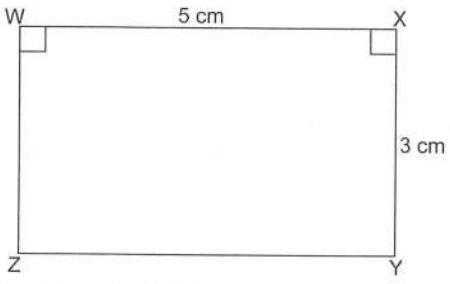
Step 1: Draw line AB of 5 cm with the use of a ruler.
Step 2: Draw an angle of 60° at point B with the use of a protractor.
Step 3: Extend the line drawn from point B to 3 cm using the ruler.
Step 4: Draw line CD of 5 cm using the ruler and set square. Ensure line CD is parallel to line AB.
Step 5: Join points D and A by drawing a line using the ruler.

2.



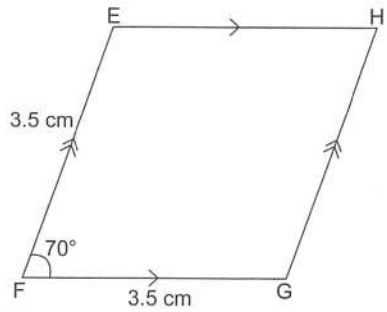
Step 1: Draw line OP of 4.5 cm with the use of a ruler.
Step 2: Draw a line of 4.5 cm at point O with a set square and ruler. Ensure this line is perpendicular to line OP. Do the same at point P. Label the two points as R and Q respectively.
Step 3: Join points R and Q by drawing a line using the ruler.

3.



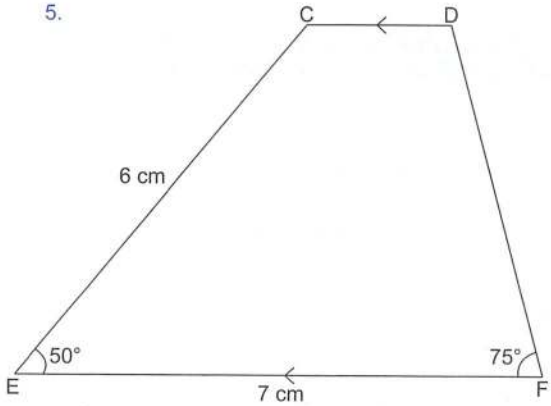
Step 1: Draw line WX of 5 cm with the use of a ruler.
Step 2: Draw a line of 3 cm at point W with a set square and ruler. Ensure this line is perpendicular to line WX. Do the same at point X. Label the two points as Z and Y respectively.
Step 3: Join points Z and Y by drawing a line using the ruler.

4.



Step 1: Draw line FG of 3.5 cm with the use of a ruler.
Step 2: Draw an angle of 70° at point F with the use of a protractor.
Step 3: Extend the line drawn from point F to 3.5 cm using the ruler. Label the line as FE.
Step 4: Draw line EH of 3.5 cm using the ruler and set square. Ensure EH is parallel to FG.
Step 5: Join points H and G by drawing a line using the ruler.

5.



Step 1: Draw line EF of 7 cm with the use of a ruler.
Step 2: Draw an angle of 50° at point E with the use of a protractor.
Step 3: Extend the line drawn from point E to 6 cm using the ruler. Label the line as EC.
Step 4: Draw line CD using the ruler and set square. Ensure CD is parallel to EF.
Step 5: Draw an angle of 75° at point F with the use of a protractor. Join points F and D by drawing a line using the ruler.

Review 6 (Questions available online.)

1. **(3)**
A rhombus has four equal sides and parallel opposite sides.

2. **(4)**
$180° - 112° - 34° = 34°$
In an isosceles triangle, angles opposite the sides are equal.

3. **(1)**
$\angle BAC = \angle ACB = 62°$ (isosceles triangle)
$\angle ABC = 180° - 62° - 62° = 56°$
(sum of $\angle$s in a triangle = 180°)

4. **(1)**
∠XWZ = ∠WZX = ∠ZXW = 60° (equilateral triangle)
∠XZY = 180° – 60° = 120° (∠s on a str. line)
∠ZXY = 180° – 35° – 120° = 25°
(sum of ∠s in a triangle = 180°)

5. **(2)**
∠d = 180° – 133° = 47°
(∠s between parallel sides add up to 180°)

6. **(4)**
ABCD is a trapezium with one pair of parallel opposite sides.

7. **(2)**

8. **71°**
∠EAD = ∠AED = ∠EDA = 60° (equilateral triangle)
∠ECD = ∠DEC
= (180° – 120°) ÷ 2
= 30° (isosceles triangle)
∠ABC = 180° – 60° – 30° – 19° = 71°
(sum of ∠s in a triangle = 180°)

9. **180°**
∠SRQ + ∠PQR = 180°
(∠s between parallel sides add up to 180°)

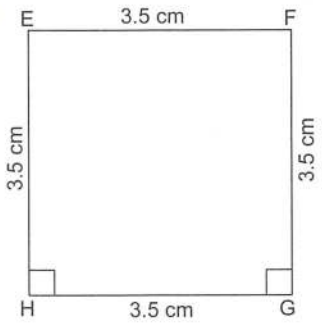
10. **6°**
∠CED = ∠DCE = 58° (isosceles triangle)
∠DEF = 180° – 116° = 64°
∠CEF = 64° – 58° = 6°

11. **360°**
180° × 2 = 360° (∠s in an equilateral triangle = 180°)

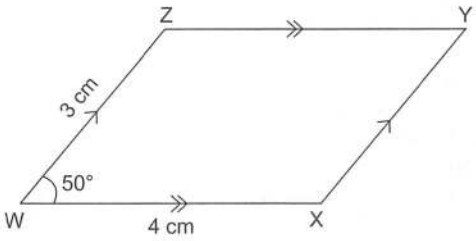
12. **104°**
∠SPQ = ∠QRS
= 104° (opp. ∠s are equal)

13. **square / rhombus**

14. ∠VWX = 180° – 79°
= **101°**
(∠s between parallel sides add up to 180°)
∠TUV = 180° – 71°
= 109°
(∠s between parallel sides add up to 180°)
∠VUX = 180° – 109°
= **71°** (∠s on a str. line)

15. 

Step 1: Draw line EF of 3.5 cm with the use of a ruler.
Step 2: Draw a line of 3.5 cm at point E with a set square and ruler. Ensure this line is perpendicular to line EF. Do the same at point F. Label the two points as H and G respectively.
Step 3: Join points H and G by drawing a line using the ruler.

16. 

Step 1: Draw line WX of 4 cm with the use of a ruler.
Step 2: Draw an angle of 50° at point W with the use of a protractor.
Step 3: Extend the line drawn from point W to 3 cm using the ruler.
Step 4: Draw line ZY of 4 cm using the ruler and set square. Ensure line ZY is parallel to line WX.
Step 5: Join points Y and X by drawing a line using the ruler and set square.

17. **108°**
∠ADB = (180° – 84°) ÷ 2
= 48° (isosceles triangle)
∠BAC = 60° (equilateral triangle)
∠EAD = 84° – 60°
= 24°
∠x = 180° – 48° – 24°
= 108° (sum of ∠s in a triangle = 180°)

18. **78°**
∠PTS = ∠SPT = ∠TSP = 60° (equilateral triangle)
∠PQR = 180° – 72°
= 108°
(∠s between the parallel sides add up to 180°)
∠TPQ = 180° – 60°
= 120°
(∠s between the parallel sides add up to 180°)
∠PQT = ∠PTQ
= (180° – 120°) ÷ 2
= 30°
∠a = 108° – 30°
= 78°

19. **120°**
4a + a + a = 180° (sum of ∠s in a triangle = 180°)
6a = 180°
a = 180° ÷ 6 = 30°
4a = 4 × 30° = 120°

20. **69°**
∠CBE = ∠CEB
= (180° – 42°) ÷ 2
= 69° (isosceles triangle)
∠ABC = 180° – 69°
= 111° (∠s on a str. line)
∠BCD = 180° – 111°
= 69°
(∠s between parallel sides add up to 180°)

(Questions available online.
Revision Test 2 Also available on Geniebook.)

1. **(2)**
550 × 30 min = 16 500 cm^3
16 500 ÷ 1000 = 16.5 *l*

2. **(1)**
$180° - 90° - 63° = 27°$
(∠s on a str. line)

3. **(2)**
$\angle BCD = 180° - 52° = 128°$
(∠s between parallel sides add up to 180°)
$\angle x = 180° - 128° = 52°$ (∠s on a str. line)

4. **(1)**
Each pair of angles between the parallel sides of a rhombus adds up to 180°, not the perpendicular sides.

5. **(2)**
5 cabinets → 2 days
1 cabinet → $\frac{2}{5}$ day
20 cabinets → $\frac{2}{5} \times 20 = \frac{40}{5} = 8$ days

6. **(2)**
$\angle ACB = 180° - 125°$
$= 55°$ (∠s on a str. line)
$\angle ABC = 180° - 20° - 55°$
$= 105°$ (sum of ∠s in a triangle = 180°)
$\angle CBD = 180° - 105°$
$= 75°$ (∠s on a str. line)

7. **(1)**
$0.052 \times 1000 = 52$ m*l*
8.052 *l* $= 8000$ m*l* $+ 52$ m*l*
$= 8$ *l* 52 m*l*

8. **(2)**
$\angle a + \angle c = 180° - 35° - 52°$
$= 93°$ (∠s on str. line)

9. **(2)**
100% + 7% → \$561.75
107% → \$561.75
1% → \$561.75 ÷ 107 = \$5.25
100% → \$5.25 × 100 = \$525

10. **(4)**
$180° - 50° - 63° = 67°$ (sum of ∠s in a triangle = 180°)

11. **(4)**
Average height of a girl = 327 ÷ 3
= 109 cm
Total height of 2 boys = 535 – 327
= 208 cm
Average height of a boy = 208 ÷ 2
= 104 cm
109 – 104 = 5 cm

12. **(2)**
100% – 45% – 15% = 40%
$\frac{40}{100} \times 72 = 28.8$ kg
$28.8 \times 1000 = 28\,800$ g

13. **(2)**
$97.8 = 0.978 \times 100$

14. **(3)**
$\angle ABD = 180° - 90° - 24°$
$= 66°$ (sum of ∠s in a triangle = 180°)
$\angle ABC = 180° - 66°$
$= 114°$ (∠s on a str. line)

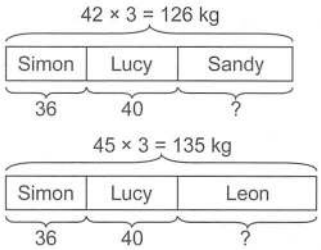
15. **(3)**
Figure (3) has two pairs of parallel opposite sides. It is a parallelogram.

16. **0.104**
$104 \div 1000 = 0.104$

17. **\$38.87**
$13 \times \$2.99 = \$38.87$

18. **2%**
$0.02 = \frac{2}{100} = 2\%$

19. **109 kg**



$3 \times 42 = 126$ kg
$126 - 36 - 40 = 50$ kg
$3 \times 45 = 135$ kg
$135 - 36 - 40 = 59$ kg
$50 + 59 = 109$ kg

20. **\$32.40**
$\frac{54}{100} \times \$60 = \$32.40$

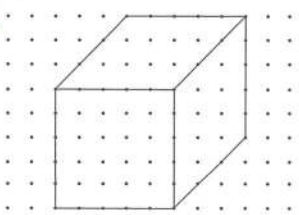
21. **25 200 m*l***
$1.8 \times 7 \times 2 = 25.2$ *l*
$25.2 \times 1000 = 25\,200$ m*l*

22. **50°, right-angled triangle**
$\angle OQP = 180° - 90° - 40°$
$= 50°$ (sum of ∠s in a triangle = 180°)
OPQ is a right-angled triangle.

23. **62°**
$\angle TUS = 180° - 144°$
$= 36°$ (∠s on a str. line)
$\angle STU = 180° - 82° - 36°$
$= 62°$ (sum of ∠s in a triangle = 180°)

24. **28 *l***
100% – 30% = 70%
$\frac{70}{100} \times 40 = 28$ *l*

25.



26. **\$72**
$\$1440 \div 20 = \$72$

27. **$\frac{13}{25}$**
$52\% = \frac{52}{100} = \frac{13}{25}$

28. **6 years 5 months**
19 years 3 months = (19 × 12) + 3 = 231 months
231 ÷ 3 = 77 months
77 months = 6 years 5 months

29. **$13 562.50**
Interest = $12 500 × 8.5% × 1
= $1062.50
$12 500 + $1062.50 = $13 562.50

30. **65°**
∠ABD = 180° – 65° – 27°
= 88°
(sum of ∠s in a triangle = 180°)
∠ABC = 180° – 27°
= 153°
(∠s between parallel sides add up to 180°)
153° – 88° = 65°

31. **40%**
6055 – 3633 = 2422
$\frac{2422}{6055} \times 100 = 40\%$

32. **$468**
$1.95 × 20 × 12 = $468

33. **$304**
1 h → $9.50
8 h → 8 × 9.50 = $76
$76 × 4 = $304

34. **208.05**
Press [C] [3] [1] [2] [0] [.] [7] [5] [÷] [1] [5] [=]

35. **416.65**
Press [C] [3] [2] [.] [0] [5] [×] [1] [3] [=]

36. ∠FGJ = 180° – 68° – 48°
= 64° (sum of ∠s in a triangle = 180°)
∠FGH = 180° – 64°
= 116° (∠s on a str. line)
∠EFG = 180° – 116°
= **64°** (∠s between parallel sides add up to 180°)

37. ∠SQR = (180° – 134°) ÷ 2
= 23° (isosceles triangle)
∠PQR = ∠PRQ = ∠RPQ = 60° (equilateral triangle)
∠SQP = 23° + 60° = **83°**

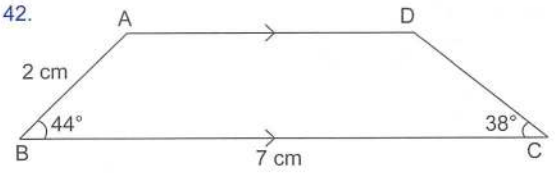
38. 5 × 790 = 3950
2910 + 3950 = 6860
6860 ÷ 7 = 980
The average number of visitors in a week is **980**.

39. (a) $2999 + $699 = $3698
$\frac{7}{100} \times \$3698 = \$258.86$
The GST was **$258.86**.
(b) $3698 + $258.86 = $3956.86
She paid **$3956.86** in all.

40. 1.5 h = 1.5 × 60 = 90 min
90 ÷ 5 = 18
18 × 200 = 3600
The machine can pack **3600** bars of chocolate in 1.5 hours.

41. 900 – 720 = 180
$0.75 = \frac{75}{100} = 75\%$
100% – 75% = 25%
$\frac{25}{100} \times 180 = 45$
There are **45** Indian students in the school.

42.



Step 1: Draw line BC of 7 cm with the use of a ruler.
Step 2: Draw an angle of 44° at point B with the use of a protractor.
Step 3: Extend the line drawn from point B to 2 cm using the ruler. Label this line as BA.
Step 4: Draw line AD using the ruler and set square. Ensure AD is parallel to line BC.
Step 5: Draw an angle of 38° at point C with the use of a protractor. Join points C and D by drawing a line using the ruler.

43. Before:
$\frac{25}{100} \times 560 = 140$
There were 420 non-apple trees.
After:
60% → 420
1% → $\frac{420}{60} = 7$
40% → 40 × 7 = 280
There are now 280 apple trees.
280 – 140 = 140
140 additional apple trees are planted.

44. (a) $1 SGD = ₱35.14 PHP
$28 SGD = 28 × 35.14
= ₱983.92 PHP
28 Singapore Dollars can be exchanged for **₱983.92 PHP**.
(b) ₱35.14 PHP = $1 SGD
₱1 PHP = $\$\frac{1}{35.14}$ SGD
₱280 PHP = $\frac{1}{35.14} \times 280$
= $7.97 SGD
280 Philippine Pesos can be exchange for **$7.97 SGD**.

45. (a) $1\frac{1}{2}$ h = 90 min
1.6 × 90 = 144 *l*
144 × 1000 = 144 000 m*l*
= 144 000 cm^3
144 000 cm^3 of water will be in the tank after $1\frac{1}{2}$ hours.
(b) 80 × 60 × 120 = 576 000 cm^3
1.6 *l* = 1600 cm^3
576 000 ÷ 1600 = 360 min
360 ÷ 60 = 6 h
It will take **6 hours** for the tank to be completely filled up with water.

46. (a) $0.45 = \frac{45}{100}$

$\frac{45}{100} \times 80 \text{ kg} = 36 \text{ kg}$

He sold 36 kg of the flour to Mr Bill.

$80 - 36 = 44$ kg of unsold flour

$58\% = \frac{58}{100}$

$\frac{58}{100} \times 44 \text{ kg} = 25.52 \text{ kg}$

He sold 25.52 kg of the flour to Mrs Drew.

$44 - 25.52 = 18.48$ kg of flour remaining

$18.48 \times 1000 = 18\,480$ g

$18\,480 \div 250 = 73.92$

≈ 73

He packed **73** 250-g packs of flour.

(b) $73 \times 250 = 18\,250$ g

$18\,480 - 18\,250 = 230$ g

230 g of flour was left.

47. $3 \times \$68 = \$204$

3 people will pay \$204.

$3 + 1 = 4$

$\$748 \div \$204 = 3.67 \ldots$

≈ 3 groups of 4 people

$3 \times \$204 = \$612$

$\$748 - \$612 = \$136$

$\$136 \div \$68 = 2$

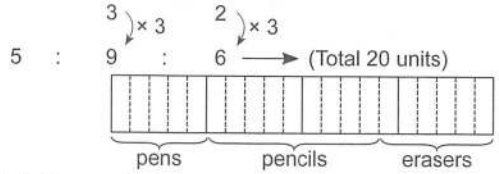
$3 \times 4 = 12$

$12 + 2 = 14$

$14 - 1 = 13$

Mrs Wong brings along **13** people.

48. Pens : Pencils : Erasers



Cost of one set:

Pens = $5 \times \$1.20$

$= \$6.00$

Pencils = $9 \times \$0.60$

$= \$5.40$

Erasers = $6 \times \$0.80$

$= \$4.80$

Total cost = $\$6.00 + \$5.40 + \$4.80$

$= \$16.20$

$\$81.00 \div \$16.20 = 5$ sets

Pencils $\rightarrow 5 \times 9 = 45$

He bought **45** pencils.

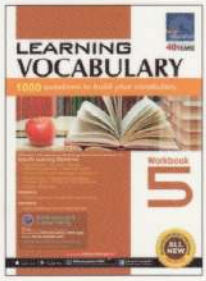
LEARNING MATHEMATICS

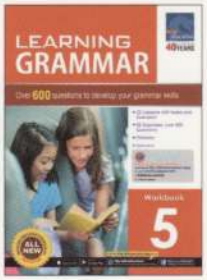
For Primary Levels

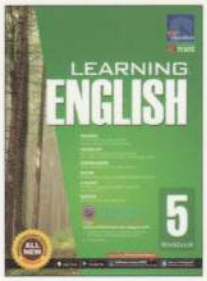
5

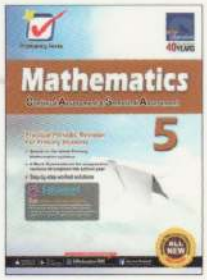
Celebrating 40 years and counting...
Committed To Your Learning

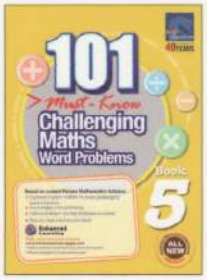
Other useful resources:

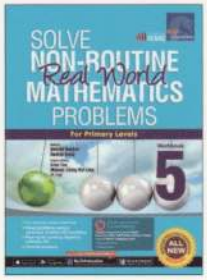


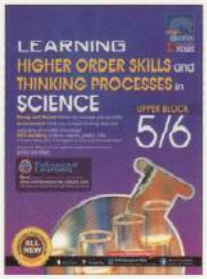


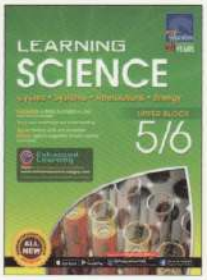












SINGAPORE BUSINESS GURUS 2013

The Entrepreneur of the year
A ROTARY-ASME AWARD

www.sapgrp.com

ISBN-13 978-981-3210-05-9
ISBN 981-3210-05-2
9 789813 210059

$16.95

SINGAPORE ASIA PUBLISHERS

SINGAPORE 1000
SINGAPORE SME 1000
INTERNATIONAL 100