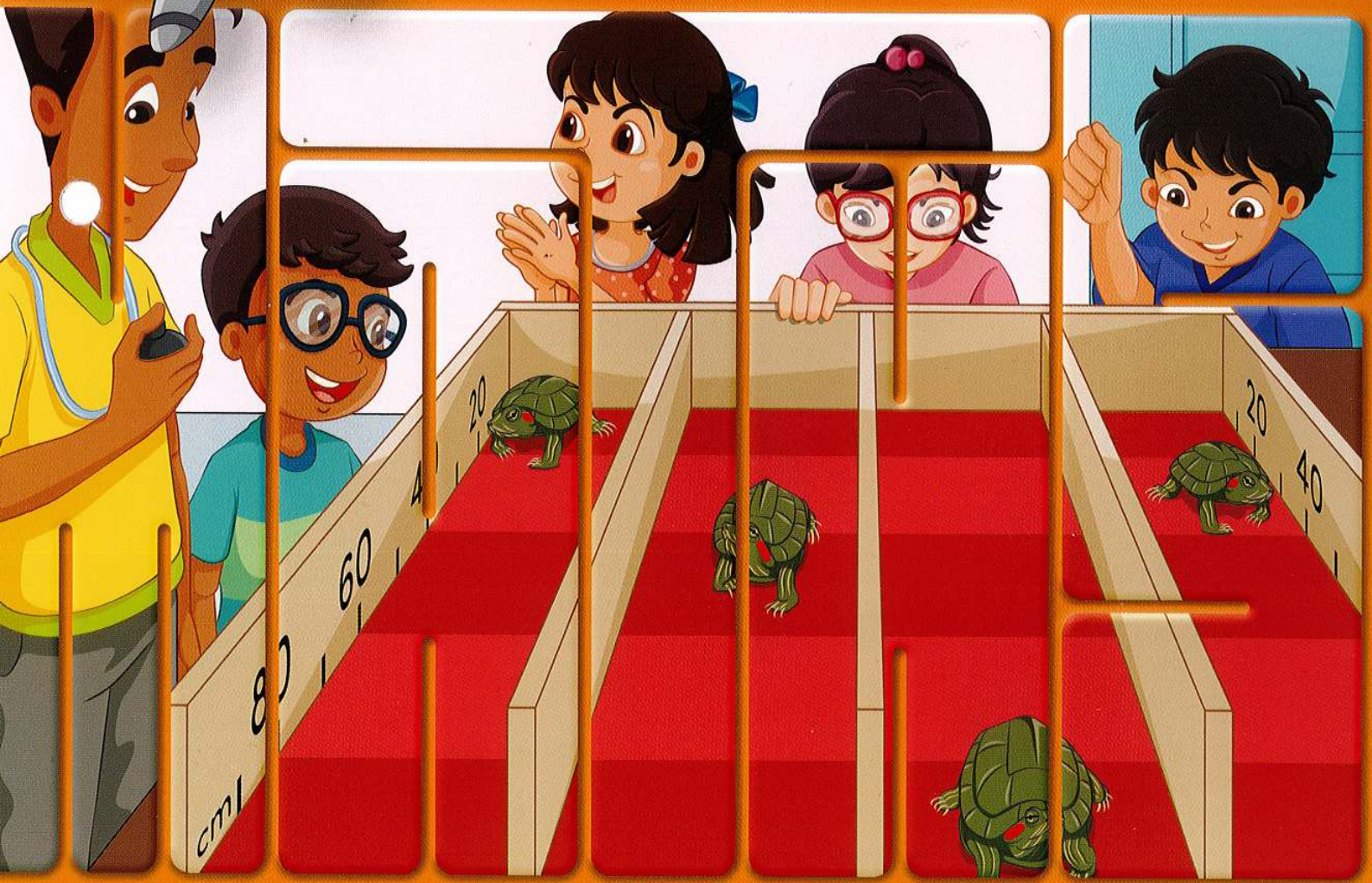
Targeting Mathematics

Student's Companion

6B

Dr Joseph Yeo Kai Kow
Sophia Lee



STAR PUBLISHING PTE LTD

Star Publishing Pte Ltd
115A Commonwealth Drive #05-12
Singapore 149596
Website: www.starpub.com.sg
Email: contactus@starpub.com.sg

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ISBN 978-981-4658-78-2

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First published 2018

Printed by KHL Printing Co Pte Ltd, Singapore

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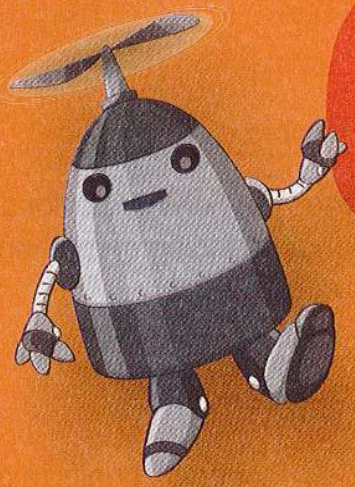

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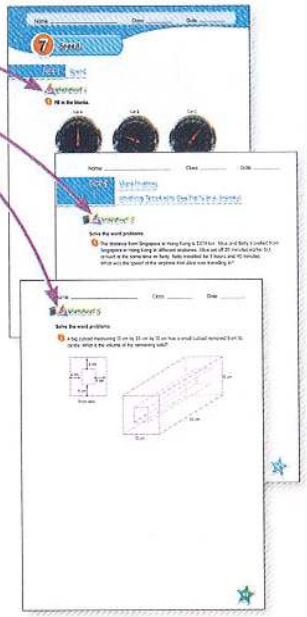
Preface

The Targeting Mathematics Student's Companion series provides additional exercises and practices for pupils to reinforce concepts learnt.

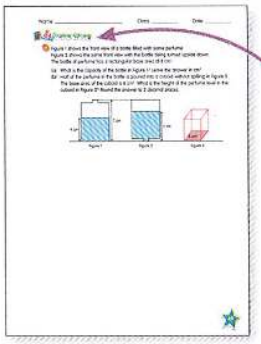
Level 1, 2, 3 Worksheets



L1 worksheets assess pupils' understanding of basic concepts to help them acquire the necessary process skills.

L2 worksheets assess pupils' understanding of moderately difficult concepts to help them acquire higher-order thinking skills.

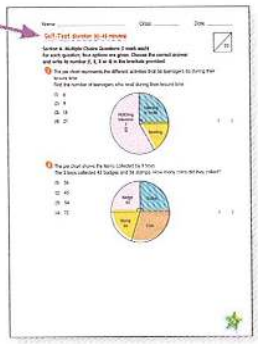
L3 worksheets assess pupils' understanding of concepts at a deeper level and aim to develop pupils' creative and critical thinking skills.



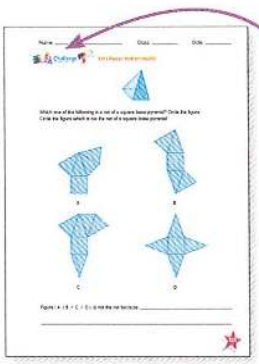
Problem Solving

Problem Solving provides pupils with opportunities to develop a deeper understanding of mathematical concepts as they attempt to solve the problems.

Self-Test



Self-Test trains pupils to complete their questions within a time limit.

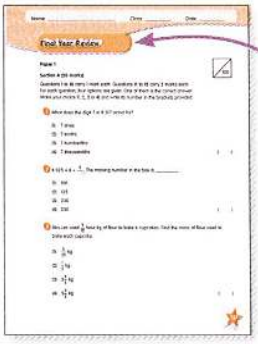


Challenge

Challenge provides questions that draw on processing and reasoning skills to solve non-routine problems.

Parent Pointers

Parent Pointers provides parents with learning outcomes and tips for teaching mathematical concepts.



Final Year Review

Final Year Review provides questions for revision.

Contents

Name: _____ Class: _____ Date: _____

7 Speed

Part 1 Speed

Worksheet 1

1 **Fill in the blanks.**

Car A

Car B

Car C

(a) Speed of Car A is _____.

(b) Speed of Car B is _____.

(c) Speed of Car C is _____.

(d) Car _____ is travelling the slowest.

(e) Car _____ is travelling the fastest.

(f) In one hour, Car A can travel _____ km.

(g) In three hours, Car A can travel _____ km.

(h) In one hour, Car B can travel _____ km.

(i) In five hours, Car B can travel _____ km.

2 **Fill in the blanks with these helping words: 'Speed', 'Distance', 'Time'.**

Time = _____ ÷ _____

Speed = _____ ÷ _____

Distance = _____ × _____

3 **Fill in the blanks.**

David recorded the time needed by a motorcycle to travel the following distances.

350 km → 5 hours
280 km → 4 hours
140 km → 2 hours

_____ km → 1 hour

The speed of the motorcycle is _____ km/h.

4 **Fill in the blanks.**

(a) Meimei can cycle 6 km in one hour.

Her speed is _____ km/h.

(b) John's grandfather can walk 50 m in one minute.

His speed is _____ m/min.

(c) An ant moves 2 cm in one second.

Its speed is _____ cm/s.

5 **Tick [✔] the correct statements.**

(a) Lorry A takes a longer time than Lorry B to travel the same distance.

Lorry A travels at a faster speed than Lorry B	
Lorry A travels at a slower speed than Lorry B	
Lorry B travels at a faster speed than Lorry A	
Lorry A and Lorry B travel at the same speed	

(b) Lorry A travels a longer distance than Lorry B in 1 hour.

Lorry A travels at a faster speed than Lorry B	
Lorry A travels at a slower speed than Lorry B	
Lorry B travels at a slower speed than Lorry A	
Lorry A and Lorry B travel at the same speed	

Name: _____ Class: _____ Date: _____

Part 2 Finding Speed, Distance and Time

Worksheet 2

Solve the word problems.

1. A motorist travelled 180 km in 3 hours. Find the speed of the motorist.

2. A bird flew a distance of 15 km in 30 minutes. What was the speed of the bird in km/h?

3 David took $\frac{2}{3}$ h to cycle 10 km. What was his cycling speed in km/h?

4 Janice jogged 2700 m from 18 20 to 19 10 on a Monday evening. What was her jogging speed?

5 A cyclist is cycling at a speed of 20 km/h. How far did the cyclist travel in 4 hours?

6 A toy car travelled a distance of 360 m at a speed of 180 m/min. How long did it take to cover the distance?

7 James's school is 1500 m away from his home. He cycles at a constant speed from home at 6.40 a.m. and reaches school at 7.05 a.m. What is his cycling speed?

8 The distance from Town A to Town B is 628 km. A train leaves Town A at 22 15 for Town B. It arrives in Town B at 05 15 the next day. What is the speed of the train? Round the answer to one decimal place.

Name: _____ Class: _____ Date: _____

Part 3 Word Problems

(Involving Speed with Two Parts in a Journey)

Worksheet 3

Solve the word problems.

1. The distance from Singapore to Hong Kong is 2574 km. Alice and Betty travelled from Singapore to Hong Kong in different airplanes. Alice set off 20 minutes earlier but arrived at the same time as Betty. Betty travelled for 3 hours and 40 minutes. What was the speed of the airplane that Alice was travelling in?

2 Mr Lim drove at a speed of 82 km/h for 2 hours. Then he changed his speed to 60 km/h for another hour. What was the total distance he travelled?

3 John and Peter started jogging from the same position but in opposite directions along a straight path. John's jogging speed was 10 km/h. After jogging for $1\frac{1}{2}$ hours, they were 27 km apart. What was Peter's jogging speed?

4 Mr Tang drove for 2 hours at a speed of 90 km/h to reach City A. If he had driven at 60 km/h, how many more hours would he take to reach City A?

Name: _____ Class: _____ Date: _____

L2 Worksheet 4

Solve the word problems.

1. At 16 45, Mr Lim started walking at a speed of 120 m/min from his home to a library, 3000 metres away. He was at the library for 2 h 15 min.

   (a) What time did he leave the library?

   (b) After leaving the library, Mr Tan walked back along the same route and took 50 min to reach home. What was his speed, in m/min, for the journey back home?

2 Mr Chen took $\frac{1}{3}$ h to travel from City A to City B at 60 km/h. He then took another 50 minutes to travel the remaining $\frac{4}{5}$ of the journey to reach City C. What was his speed from City B to City C?

Name: _____ Class: _____ Date: _____

Part 4 Average Speed

Worksheet 5

Solve the word problems.

1. Jane took 13 min to jog 1500 m and another 20 min to walk 1800 m. What was her average speed?

2. A motorcyclist travels at an average speed of 80 km/h. How many minutes will the motorcyclist need to travel 20 km?

3 Ahmad took 30 minutes to jog 6.5 km and 20 minutes to jog another 3.5 km. What was Ahmad's average jogging speed in km/h?

4 Noreen drove a distance of 90 km from Point A to Point B for $1\frac{1}{2}$ h. She then continued driving to Point C and covered another 35 km in $\frac{1}{2}$ h. Find her average driving speed for the whole journey.

Name: _____ Class: _____ Date: _____

Part 5 Word Problems (Involving Speed with Two Moving Objects)

LZ Worksheet 6

Solve the word problems.

1. A car travels 420 km to Kuala Lumpur at an average speed of 70 km/h. The car leaves Singapore at 09 00. What time will the car arrive in Kuala Lumpur?

2. David cycles at an average speed of 10 km/h from his house to his grandmother's house. His grandmother's house is 2 km away from his house. At what time must David set off from his house in order to reach his grandmother's house at 7.20 p.m.?

3 A car travelled at 70 km/h for $2\frac{1}{2}$ hours. Then it travelled at 84 km/h for $3\frac{1}{2}$ hours. What was its average speed for the whole journey?

Name: _____ Class: _____ Date: _____

L2 Worksheet 7

Solve the word problems.

1. Amy and Beth started jogging from the same point along a straight path. They started at the same time but in opposite directions. After jogging for 40 minutes, they were 7 km apart. Beth jogged at a speed of 6 km/h. What was Amy's jogging speed in km/h?

2 At 8 a.m., a car leaves City A for City B at a speed of 70 km/h. At the same time, a lorry leaves City B for City A at a speed of 50 km/h. The distance between the two cities is 480 km. At what time do the 2 vehicles pass each other?

3 A post office is 420 m away from Roy's house. Roy walked at an average speed of 70 m/min from his house to the post office. His sister started 2 minutes later and walked at an average speed of 60 m/min. When Roy reached the post office, how far away was his sister from the post office?

4 At 9 a.m., Meng and Rajah left their company to attend an event at a hotel. Meng drove 6 km/h faster than Rajah and reached the hotel at 10.30 a.m. When Meng reached the hotel, Rajah only covered $\frac{3}{4}$ of the total distance. What was the distance between their company and the hotel?

Name: _____ Class: _____ Date: _____

L3 Worksheet 8

Solve the word problems.

1. Ken travelled from City A to City B. He took $2\frac{1}{2}$ hours to travel the first 156 km and $\frac{3}{5}$ of that time to travel the remaining $\frac{2}{5}$ of the journey.

   (a) How many minutes did Ken take to travel the remaining $\frac{2}{5}$ of the journey?

   (b) What was his average speed for the whole journey?

2 At 07 10, Jen jogs towards Evergreen Park at an average speed of 9 km/h. 25 minutes later, Jen's brother cycles from the house to meet her at Evergreen Park. Jen's brother does not change his speed from his house to Evergreen Park. When Jen reaches Evergreen Park at 08 00, her brother is 3 km away.

(a) What is the distance between their house and Evergreen Park?

(b) What is her brother's cycling speed?

3 A car took 3 hours to complete the last $\frac{3}{4}$ of a journey at a constant speed of 75 km/h. Its average speed for the whole journey was 80 km/h. What was the average speed of the car in the first $\frac{1}{4}$ of the journey?

4 Peiyi drives from Town A to Town B at an average speed of 80 km/h. Ismail leaves Town A one hour earlier than Peiyi and takes 5 hours to reach Town B, travelling at an average speed of 72 km/h. Ismail reaches Town B at 7 p.m.

(a) At what time does Peiyi leave Town A?

(b) How far away is Peiyi from Ismail at 7 p.m.?

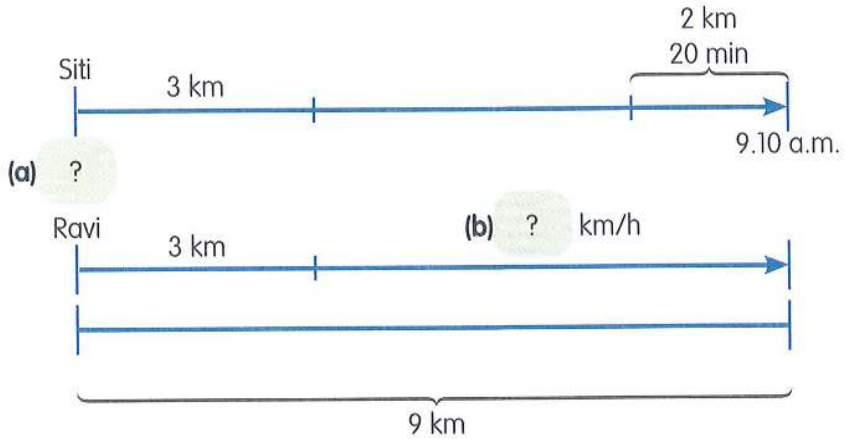
Name: _____ Class: _____ Date: _____

L3 Problem Solving

1. Ravi and Siti start from the same point in a 9-km race. Both of them run at the same speed for the first 3 km. For the remaining 6 km, Ravi runs at a faster speed. Ravi arrives at the finishing point 20 minutes before Siti who is 2 km behind him. Siti does not change her speed throughout the race and she completes the race at 9.10 a.m.

   (a) At what time does the race start?

   (b) What is Ravi's speed for the remaining 6 km of the race in km/h?



2 Agnes and Bryan started jogging around a 400-m track. They started at the same time and in the same direction. Agnes took 2 minutes to complete each round and Bryan took $1\frac{1}{2}$ minutes to complete each round. Both of them did not change their speeds throughout.

(a) What was the distance between them after 45 seconds?

(b) How many **complete** rounds did Bryan run before passing Agnes for the first time?

Name: _____ Class: _____ Date: _____

Self-Test (Duration: 30–45 minutes)

20

Section A: Multiple-Choice Questions (1 mark each)
For each question, four options are given. Choose the correct answer and write its number (1, 2, 3 or 4) in the brackets provided.

1. A bullet train travelled 80 km in 20 minutes. Find the speed of the bullet train.

(1) 360 km/h

(2) 240 km/h

(3) 40 km/h

(4) 6 km/h ( )

2. Mrs Lee travels 2 hours and covers $\frac{2}{3}$ of her journey from City P to City Q. Her average speed is 60 km/h. What is the total distance between the two cities?

(1) 30 km

(2) 60 km

(3) 120 km

(4) 180 km ( )

3. A coach travelled from Town A to Town B at an average speed of 100 km/h. On the way back, it covered the same distance in 5 hours at a speed of 80 km/h. Find the total time taken for the whole journey.

(1) 10 hours

(2) 9 hours

(3) 5 hours

(4) 4 hours ( )

4 Van A left Happy Town for Evergreen Town at 8 a.m., travelling at a speed of 100 km/h. An hour later, Van B left Evergreen Town for Happy Town travelling at a speed of 90 km/h. The distance between the two towns is 480 km. What time did the two vans pass each other?

(1) 11 a.m.

(2) 11.30 a.m.

(3) 12 p.m.

(4) 12.30 p.m. ( )

5 A lift can travel from Level 1 to Level 25 in 30 seconds. The distance between Level 1 and the next level is 2 m. Find the speed of the lift.

(1) $1\frac{7}{8}$ m/s

(2) $1\frac{4}{5}$ m/s

(3) $1\frac{3}{5}$ m/s

(4) $1\frac{2}{3}$ m/s ( )

Section B: Short-Answer Questions (8 marks)

For each question, write your answer in the space provided. The number of marks available is shown in brackets [ ] at the end of each question.

6 A cylinder was rolled from one end of a room to another end at a speed of 40 cm/s. The distance between the two ends of the room was 2 m. How many minutes did the cylinder take to roll between the two ends?

Ans: _____ min [2]

7 Mei started walking at 30 m/min while Shanti started walking at 50 m/min. They started at the same time walking in the same direction. They did not change their speeds throughout. How far apart were they after 1 hour?

Ans: _____ km [2]

8 A lorry travelled at a constant speed of 72 km/h for $1\frac{1}{2}$ h. It then travelled another 12 km for $\frac{1}{2}$ h. What was its average speed?

Ans: _____ km/h [2]

9 James and Ricky started their walk when they are 960 m apart. James walked at a speed of 75 m/min towards Ricky while Ricky walked towards James at a speed of 85 m/min. How far did James walk when they first passed each other?

Ans: _____ m [2]

Section C: Long-Structured Questions (7 marks)

Show your working clearly. The number of marks available is shown in brackets [ ] at the end of each part-question.

10 At 10.45 a.m., Alex left Town A for Town B cycling at a speed of 8 km/h throughout his journey. At the same time, Henry also left Town B for Town A at a speed that was 2 km/h slower than Alex. At 12 noon, both of them were still 2 km apart.

(a) How many kilometres did Henry travel by 12 noon?

(b) What was the distance between Town A and Town B?

Ans: (a) _____ km [2]

(b) _____ km [1]

11 At 10.30 p.m., Train A departs Station P and travels towards Station Q at a constant speed of 80 km/h. Half an hour later, Train B departs Station Q and travels towards Station P at a constant speed of 90 km/h. The distance between the two stations is 550 km.

(a) How far has Train A travelled when Train B departs Station Q?

(b) At what time do both trains pass each other?

Ans: _____ km [1]

_____ a.m. [3]

Name: _____ Class: _____ Date: _____

L3 Challenge (Let's Reason Mathematically)

Alan, Ben and Calvin estimated that they had to drive more than 100 km to a resort. They decided to take turns for driving. Alan drove $\frac{1}{3}$ of the journey at an average speed of 80 km/h. Then Ben took over and drove for half an hour at an average speed of 70 km/h. Then Calvin took over and drove the remaining $\frac{1}{4}$ of the journey.

(a) How far did Ben drive?

(b) For how long did Alan drive?

(c) Their total distance travelled was more than 100 km. Do you agree? Explain.

Parent Pointers

Learning Outcomes

By the end of this chapter, your child should be able to do the following.

- Discuss about a journey and recognise that there are 3 related quantities (distance, time and speed)
- Find speed, distance and time
- Draw a diagram to show different scenarios of speed, distance and time
- Solve up to 3-step word problems involving speed and average speed

Teach-At-Home Tips

Parents can engage your child in the following activity and lead your child to find the speed of a moving cylinder. Parents may provide your child with a stopwatch, calculator and some cylinders of different sizes.

1. On the floor, mark two points, Y and Z of a distance of 200 cm.

2. Roll each cylinder from Points Y to Z. Use a stopwatch to measure the time and record it in a table.

3. Calculate the speed of each cylinder of different sizes.

Cylinder	Distance (cm)	Time Taken (s)	Speed (cm/s) (Distance ÷ Time)
A	200		
B	200		
C	200		
D	200		

4. Ask your child the following questions:
   (a) Which cylinder rolls the slowest?
   (b) Which cylinder rolls the fastest?
   (c) Is speed a special kind of rate? Why?

Name: _____ Class: _____ Date: _____

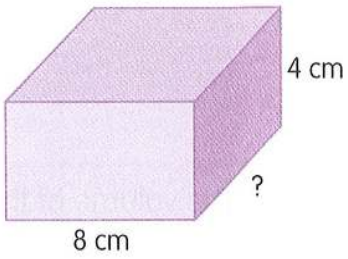
8 Volume

Part 1 Finding an Edge of a Cuboid

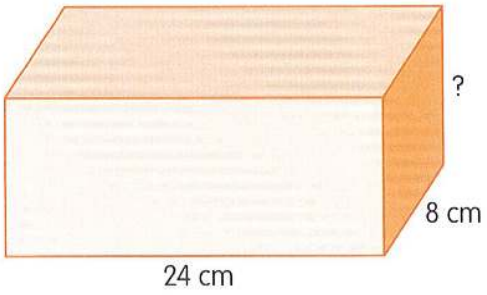
Worksheet 1

1 Find the unknown edge of each cuboid.

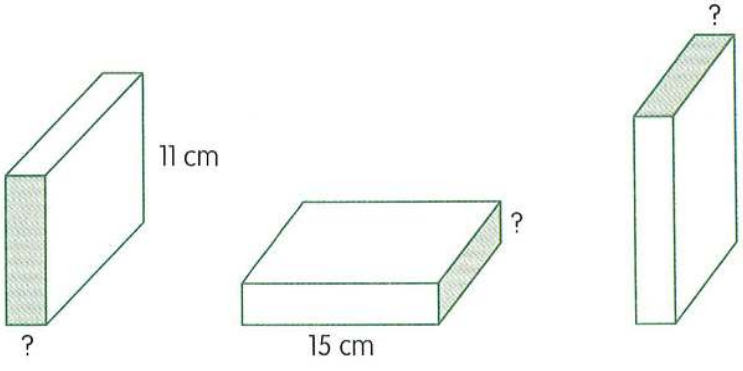
(a) The volume of the cuboid is 160 cm^3.



(b) The volume of the cuboid is 1920 cm^3.

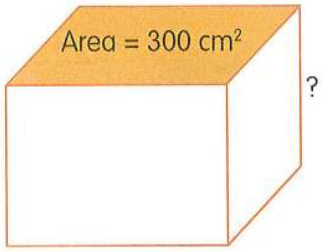


2 The volume of a cuboid is 495 cm^3. The cuboid is placed in 3 different positions as shown. Find the unknown side of the cuboid.

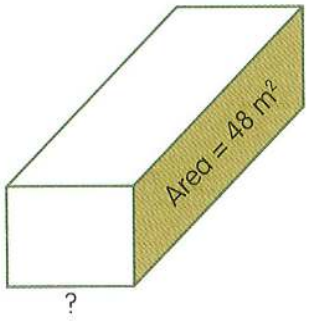


3 **Find the unknown edge of each cuboid.**

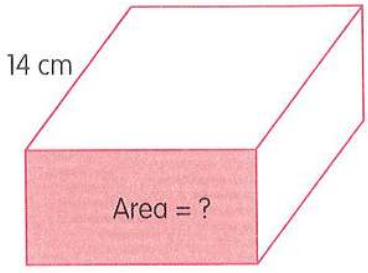
(a) The volume of the cuboid is 2700 cm^3 and the area of its shaded face is 300 cm^2.



(b) The volume of the cuboid is 288 m^3 and the area of its shaded face is 48 m^2.



4 The breadth of a rectangular box is 14 cm and its volume is 2730 cm^3. What is the area of the shaded face of the box?



Name: _____ Class: _____ Date: _____

Part 2 Finding an Edge of a Cube

Worksheet 2

1 **Find the square root of each number.**

(a) $\sqrt{64}$ =

(b) $\sqrt{144}$ =

(c) $\sqrt{256}$ =

(d) $\sqrt{400}$ =

2 **Find the cube root of each number.**

(a) $\sqrt[3]{1000}$ =

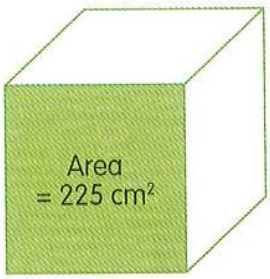
(b) $\sqrt[3]{729}$ =

(c) $\sqrt[3]{3375}$ =

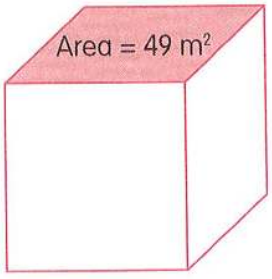
(d) $\sqrt[3]{12167}$ =

3 **Find the length of one edge of each cube.**

(a) The shaded face of the cube has an area of 225 cm^2.

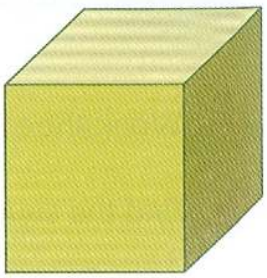


(b) The area of each face of the cube is 49 m^2.

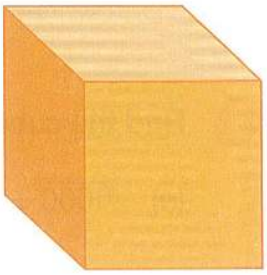


4 **Find the length of one edge of each cube.**

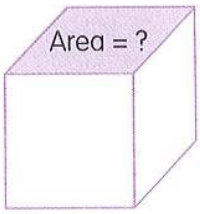
(a) The volume of the cube is 343 cm^3.



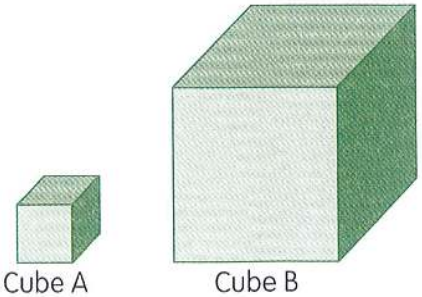
(b) The volume of the cube is 64 m^3.



5 The volume of a cube is 512 cm^3. Find the area of the shaded face of the cube.



6 The volume of Cube A is 27 cm^3. The length of Cube B is three times as long as the length of Cube A. What is the volume of Cube B?



Name: _____ Class: _____ Date: _____

Part 3 Word Problems

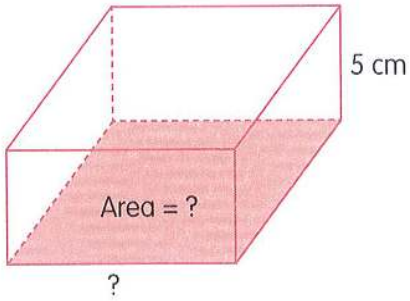
L2 Worksheet 3

Solve the word problems.

1. The volume of a cuboid is 720 cm^3. It has a square base and a height of 5 cm.

   (a) What is the area of the square base?

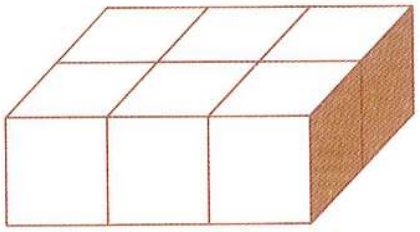
   (b) What is the length of the square base?



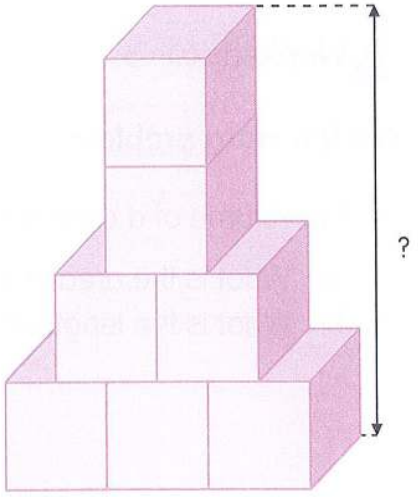
2. The cuboid is made up of 6 identical cubes of sides 3 cm.

   (a) What is the shaded area as shown?

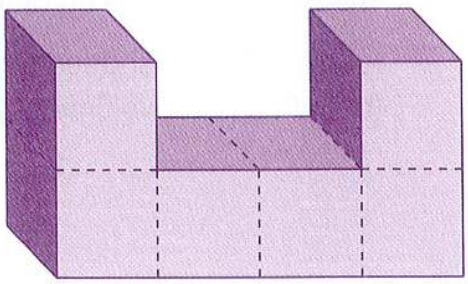
   (b) What is the volume of the cuboid?



3 The figure is made up of 7 identical cubes. It has a total volume of 1512 cm^3. What is the height of the figure?



4 Aishad put a block of wood into a big tin of purple paint. She then cut it into six identical cubes along the dotted lines and separated them. The total unpainted area of the six identical cubes was 250 cm^2. Find the volume of each cube.

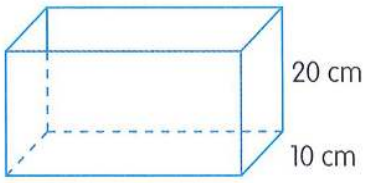


Name: _____ Class: _____ Date: _____

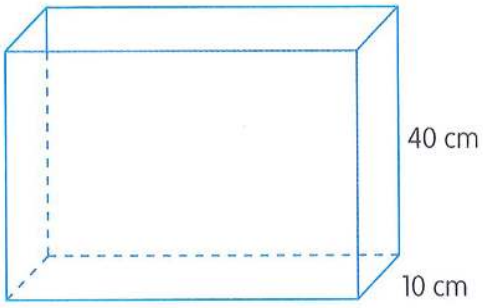
L2 Worksheet 4

Solve the word problems.

1. Peter pours the same amount of water into two empty tanks, A and B. Tank A is half full. How much more water is needed to fill up Tank B to its brim? Express the answer in litres.

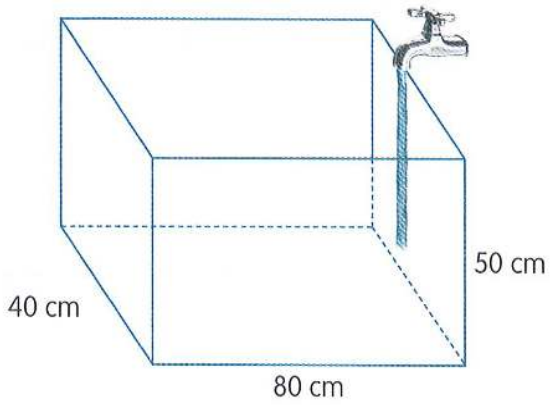


Tank A



Tank B

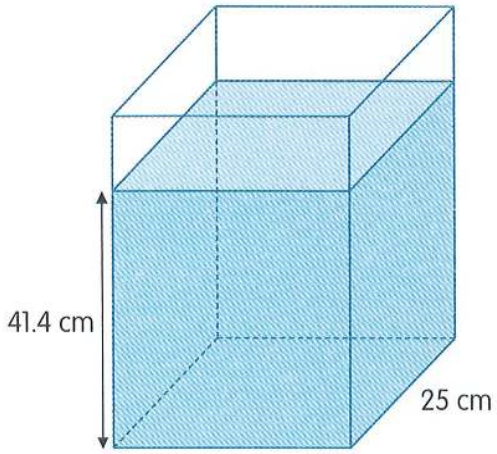
2 At first, a rectangular tank measuring 80 cm by 40 cm by 50 cm was empty. A tap was turned on and water flowed into the tank at a rate of 6 litres per minute. How long will it take to fill the tank completely? Give the answer to the nearest minute.



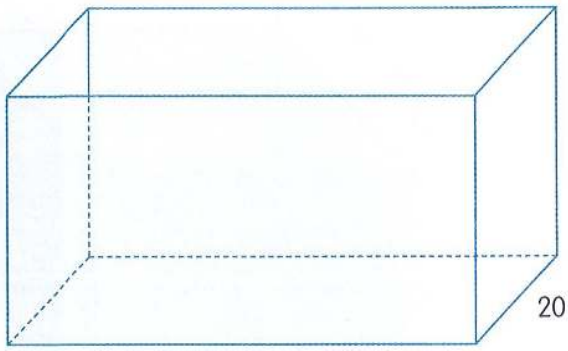
3 Tank A and Tank B are two rectangular tanks. At first, Tank A contained water to a height of 41.4 cm and Tank B was empty.

(a) What was the volume of the water in Tank A at first?

(b) Roy then poured some water from Tank A to Tank B. After that, the height of the water level in Tank A was thrice that in Tank B. Find the volume of water remaining in Tank A. Give the answer in litres.



Tank A



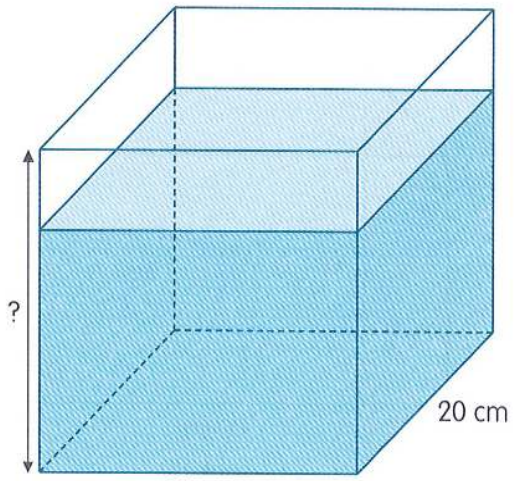
Tank B

4 Tank A, measuring 25 cm long and 20 cm wide, is $\frac{3}{4}$ filled with water.

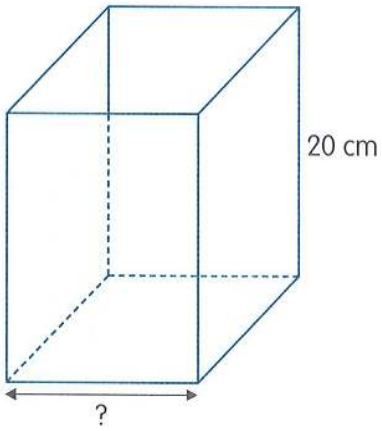
Tank B has a square base with a height of 20 cm. At first, the volume of water in Tank A is 9000 cm^3 and Tank B was empty.

(a) What is the height of Tank A?

(b) Half of the water from Tank A is poured to the brim of Tank B without spilling. What is the length of Tank B?



Tank A



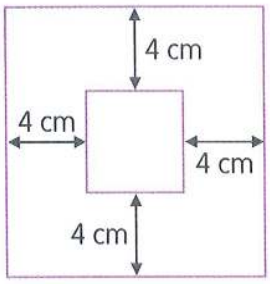
Tank B

Name: _____ Class: _____ Date: _____

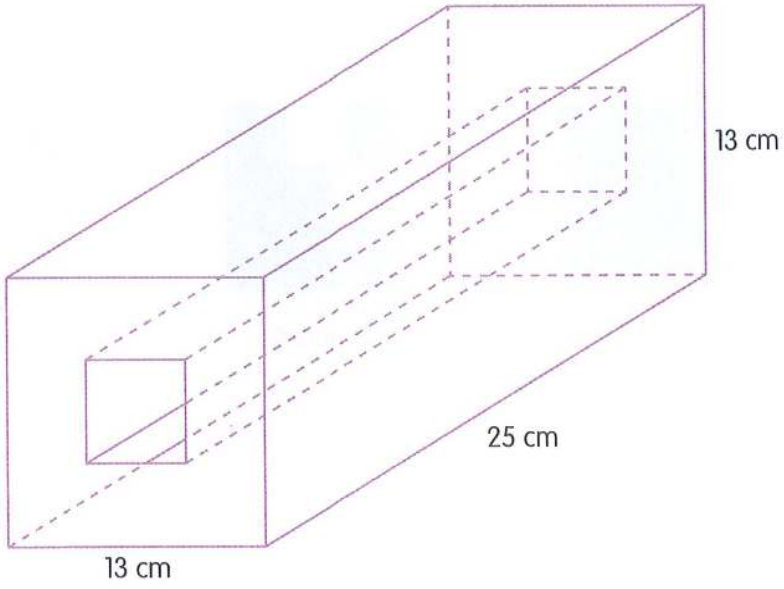
L3 Worksheet 5

Solve the word problems.

1. A big cuboid measuring 13 cm by 25 cm by 13 cm has a small cuboid removed from its centre. What is the volume of the remaining solid?



Front view



2 Candy stacked some cubes into a solid as shown. The base area of each cube is 9 cm^2. The volume of the solid is 378 cm^3.

(a) What is the volume of one cube?

(b) How many cubes did Candy use?

(c) Candy observed her solid from the top.
Which figure (1, 2, 3 or 4) represents the top view of solid?

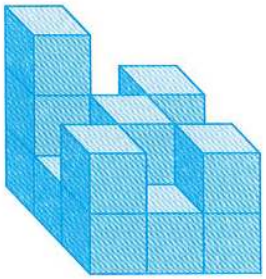


Figure 1

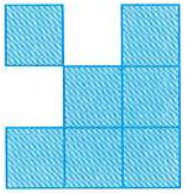


Figure 2

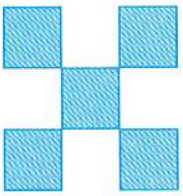


Figure 3

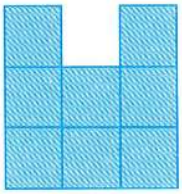
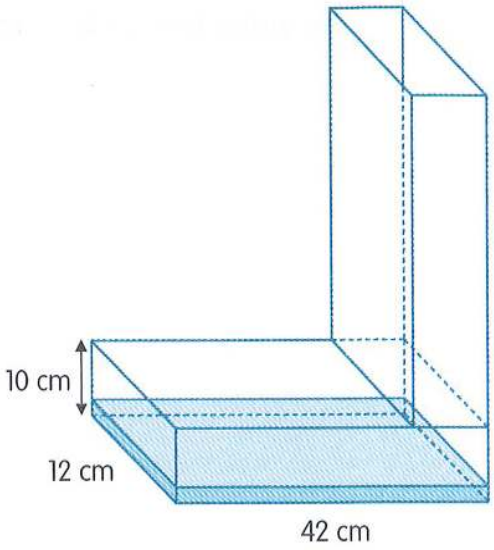


Figure 4

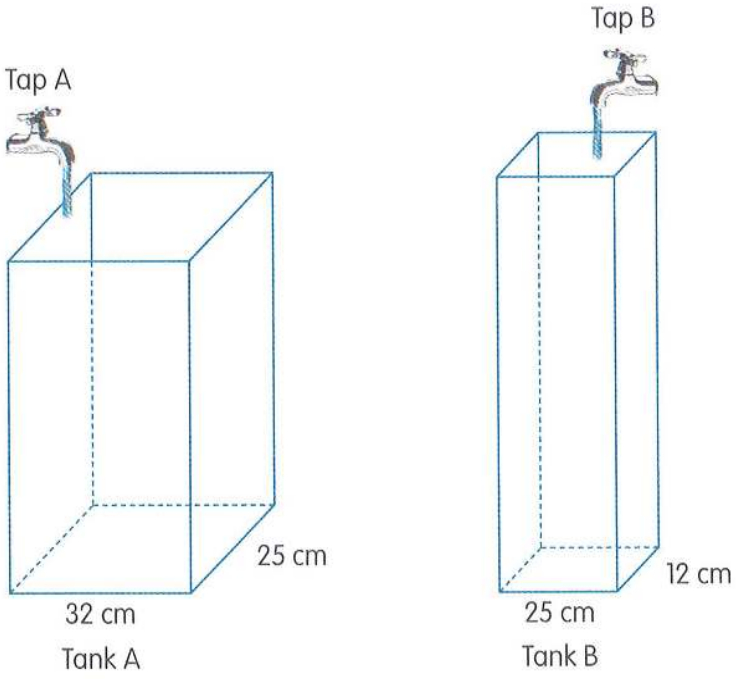
3 The figure shows an L-shaped tank which is made up of two identical cuboids. Each cuboid measures 42 cm by 12 cm by 10 cm. The tank is filled with 1 litre of water. If another 6.08 ℓ of water is poured into the tank without spilling, what is the water level from the base of the tank?



4 Tap A and Tap B were turned on to fill up two empty tanks, Tank A and Tank B, with water respectively. Water was flowing from Tap A at 1.2 litres per minute and from Tap B at 1.8 litres per minute. Tap A was turned on at 11 a.m.

(a) What was the height of the water level in Tank A after 12 minutes?

(b) Tap B was then turned on at 11.12 a.m. At what time would the height of the water level in both tanks be equal?



Name: _____ Class: _____ Date: _____

L3 Problem Solving

1. Figure 1 shows the front view of a bottle filled with some perfume.
Figure 2 shows the same front view with the bottle being turned upside down.
The bottle of perfume has a rectangular base area of 8 cm^2.

   (a) What is the capacity of the bottle in Figure 1? Leave the answer in cm^3.

   (b) Half of the perfume in the bottle is poured into a cuboid without spilling in Figure 3. The base area of the cuboid is 6 cm^2. What is the height of the perfume level in the cuboid in Figure 3? Round the answer to 2 decimal places.

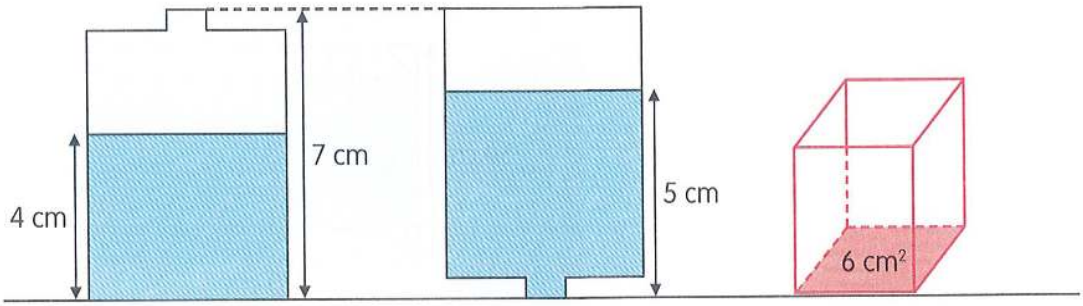
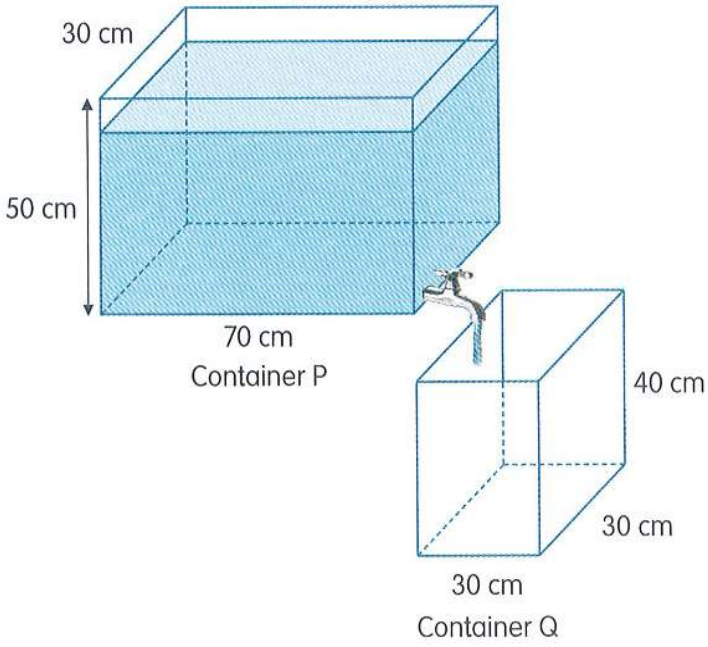


Figure 1 Figure 2 Figure 3

2 In the figure, Container P measuring 70 cm by 30 cm by 50 cm is $\frac{5}{6}$ filled with water. Container Q is empty. The tap is turned on and water flows out of Container P at a constant rate into Container Q measuring 30 cm by 30 cm by 40 cm. After 70 seconds, Container P is $\frac{4}{5}$ full. The tap is turned off when the heights of the water level in the two containers are equal.

(a) At what rate is the water flowing out of Container P? Give the answer in cm^3/s.

(b) For how long is the tap turned on? Give the answer in minutes.



Name: _____ Class: _____ Date: _____

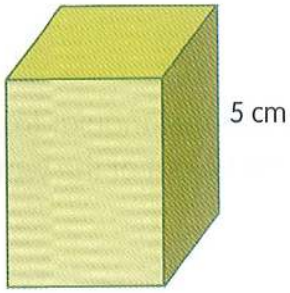
Self-Test (Duration: 30–45 minutes)

20

Section A: Multiple-Choice Questions (1 mark each)
For each question, four options are given. Choose the correct answer and write its number (1, 2, 3 or 4) in the brackets provided.

1. A solid cuboid of height 5 cm has a square base. The volume of the cuboid is 80 cm^3. What is the length of the base?

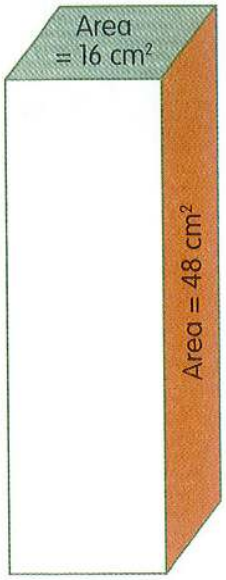
(1) 16 cm
(2) 8 cm
(3) 5 cm
(4) 4 cm



( )

2. The figure shows a cuboid with a green shaded square face area of 16 cm^2. The area of the orange shaded rectangular face is 48 cm^2. What is the height of the cuboid?

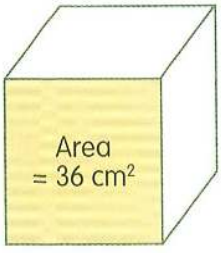
(1) 16 cm
(2) 12 cm
(3) 3 cm
(4) 4 cm



( )

3. The figure shows a cube with a shaded part of area 36 cm^2. What is the volume of the cube?

(1) 216 cm^3
(2) 729 cm^3
(3) 1728 cm^3
(4) 5832 cm^3



( )

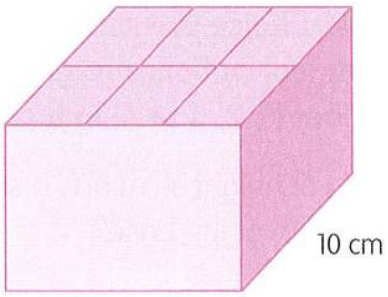
4 The figure shows a box which can fit 12 identical cubes. What is the capacity of the box?

(1) 300 cm^3

(2) 750 cm^3

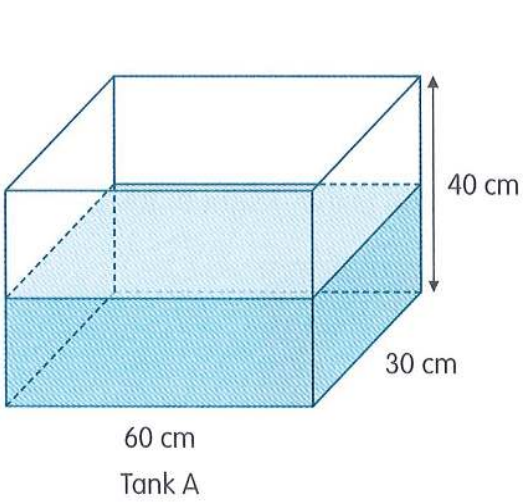
(3) 1500 cm^3

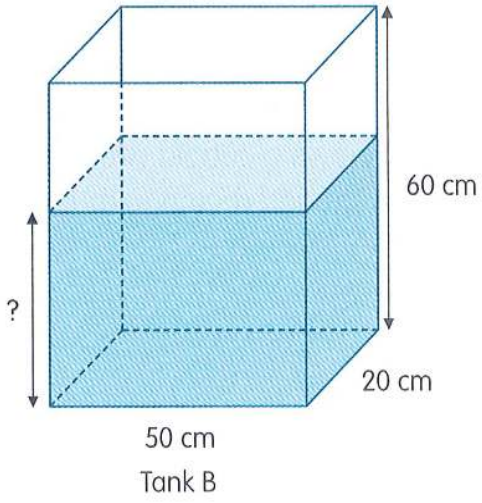
(4) 1800 cm^3



( )

5 The figure shows two rectangular tanks filled with the same amount of water. Tank A is half full. What is the height of the water level in Tank B?





(1) 20 cm

(2) 24 cm

(3) 30 cm

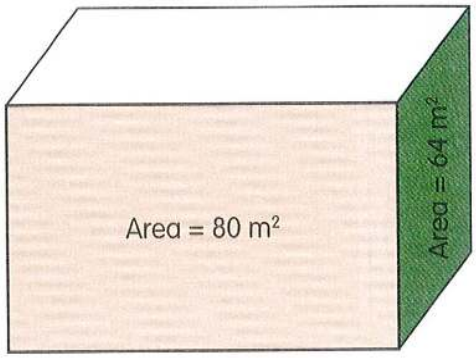
(4) 36 cm

( )

Section B: Short-Answer Questions (8 marks)

For each question, write your answer in the space provided. The number of marks available is shown in brackets [ ] at the end of each question.

6 The figure shows a solid cuboid. It has a green shaded square face area of 64 m^2 and an orange shaded rectangular face area of 80 m^2. What is its volume?

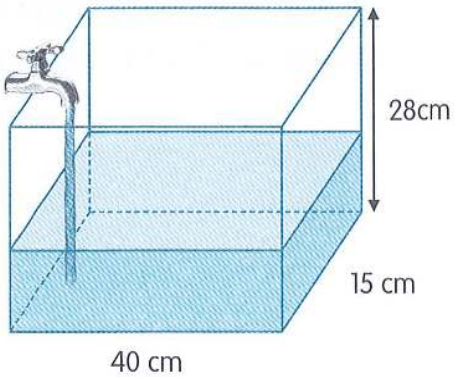


Ans: _____ m^3 [2]

7 A cube of volume 343 cm^3 has only two of its faces painted. What is the total area of the unpainted faces?

Ans: _____ cm^2 [2]

8 A rectangular tank measures 40 cm by 15 cm by 28 cm. Water from a tap flows into the rectangular tank at a rate of 250 cm^3 per minute. How long does it take to fill $\frac{3}{4}$ of the tank?



Ans: _____ min [2]

9 A rectangular tank measuring 60 cm by 30 cm by 50 cm is filled with water to its brim. All the water in the tank is then transferred into mugs with a capacity of 900 cm^3 each. How many mugs are required?

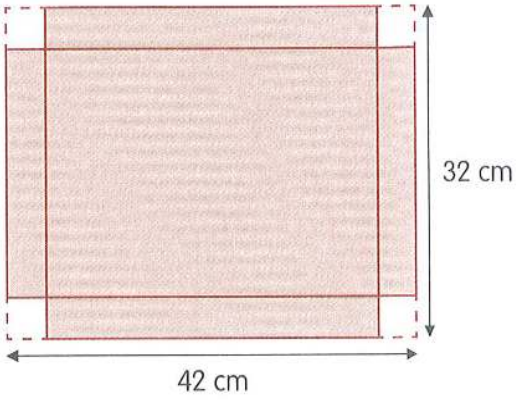
Ans: _____ [2]

Name: _____ Class: _____ Date: _____

Section C: Long-Structured Questions (7 marks)

Show your working clearly. The number of marks available is shown in brackets [ ] at the end of each part-question.

10 The rectangular cardboard measures 42 cm by 32 cm. Four identical squares, each of area 16 cm^2, are cut off from the corners. The remaining piece is folded into a box. What is the volume of the box?



Ans: _____ cm^3 [3]

11 A rectangular tank measures 25 cm by 18 cm by 20 cm. Janice fills $\frac{4}{9}$ of the tank with water.

(a) What is the volume of water in the tank? Give the answer in litres.

(b) She uses a pail whose capacity is 20% of the capacity of the tank. What is the minimum number of pails needed to fill water to the brim of the tank?

Ans: _____ litres [1]

_____ [3]

Name: _____ Class: _____ Date: _____

L3 Challenge (Let's Reason Mathematically)

A drinks seller wants to order some cardboard boxes to contain fruit juice.
Each box is to fill one litre of fruit juice.
For easy stacking and packing, the boxes are to be cuboids.

The drinks seller is considering 3 possible cuboids of different dimensions:
Cuboid A which measures 6 cm by 6 cm by 26 cm,
Cuboid B which measures 7 cm by 7 cm by 21 cm,
and Cuboid C which measures 9 cm by 10 cm by 12 cm.

Which cuboid would you choose? Give reasons to explain your choice.

Parent Pointers

Learning Outcomes

By the end of this chapter, your child should be able to do the following.

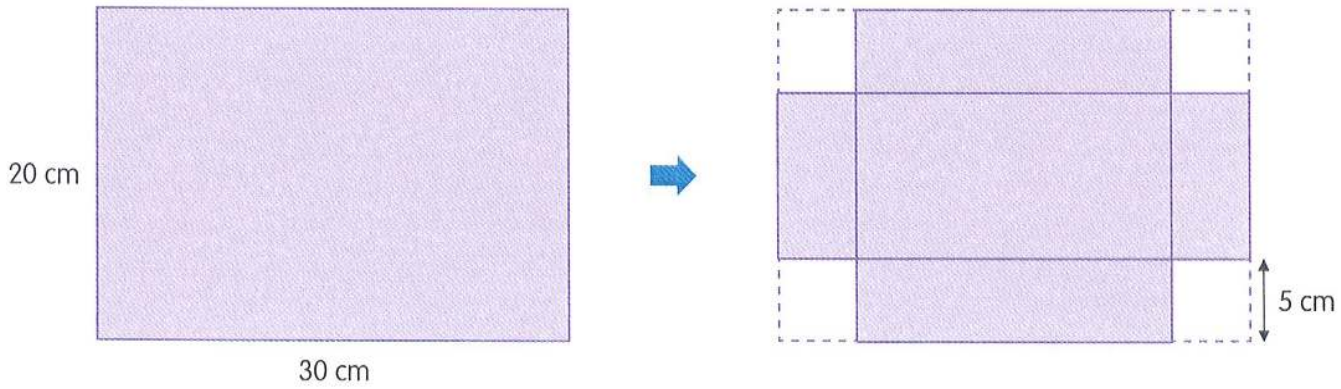
- Find one dimension of a cuboid given its volume and the other dimensions
- Find the length of one edge of a cube given its volume
- Find the height of a cuboid given its volume and base area
- Find the area of a face of a cuboid given its volume and one dimension

Teach-At-Home Tips

Parents can provide your child with a rectangular cardboard measuring 30 cm by 20 cm.

Use the following steps to make a cuboid.

1. Cut out the four identical 5-cm squares from the corners of the rectangular cardboard.
2. Fold it into a cuboid.
3. Fasten the edges of the cuboid with a tape.
4. Measure and record the length, breadth and height of the cuboid.
5. Calculate its volume.
6. Find the area of the rectangular base.



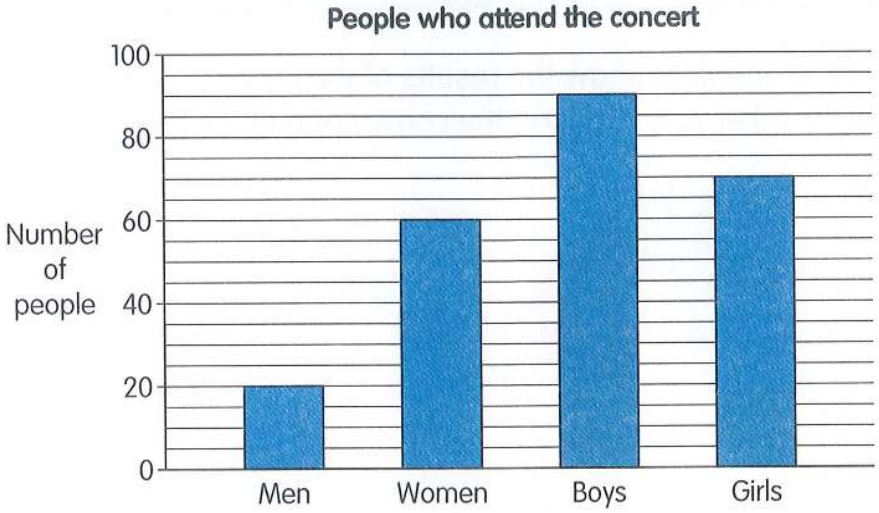
Name: _____ Class: _____ Date: _____

9 Pie Charts

Part 1 Presenting Data in Pie Charts

Worksheet 1

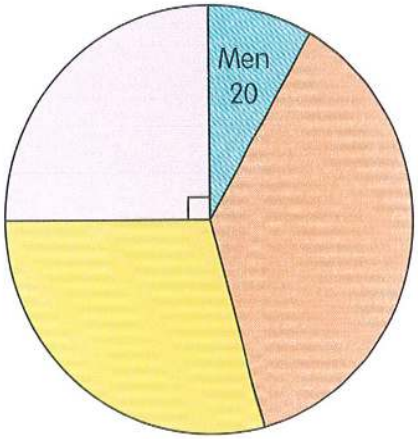
1 The bar graph shows the number of people who attend a concert.



(a) Complete the table by using the information from the bar graph.

Types of people	Men	Women	Boys	Girls	Total
Number of people	20				240

(b) Use the information from the bar graph to complete the pie chart.



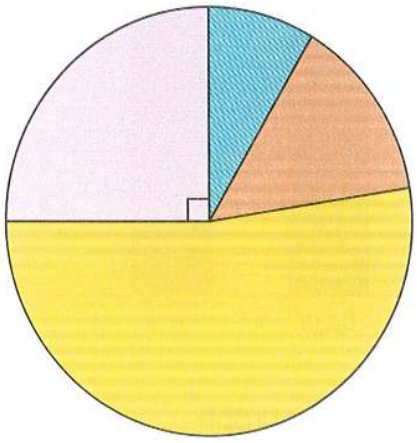
2 Use the information below to answer the questions.
The table records the results of a survey on 200 teenagers.

How often do you play computer games?

Answer Given	Size of group	Group
"Always"	More than 50%	A
"Often"	25%	B
"Sometimes"	14%	C
"Never"	A small percentage	D

A pie chart is drawn to show the results of the survey.

(a) Write the letter A, B, C or D in the correct part of the pie chart shown.



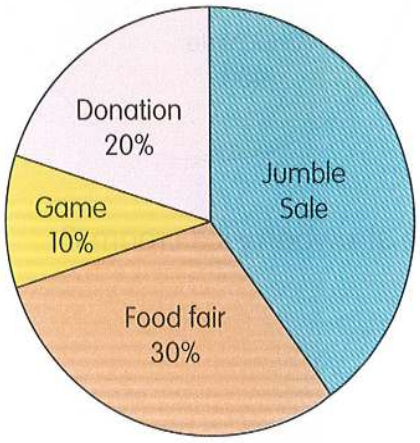
(b) How many teenagers give the answer as "Often"?

Name: _____ Class: _____ Date: _____

Part 2 Reading and Interpreting Data in Pie Charts

Worksheet 2

1 The pie chart shows how pupils in Champion Primary School raised $50 000 for their school building fund.



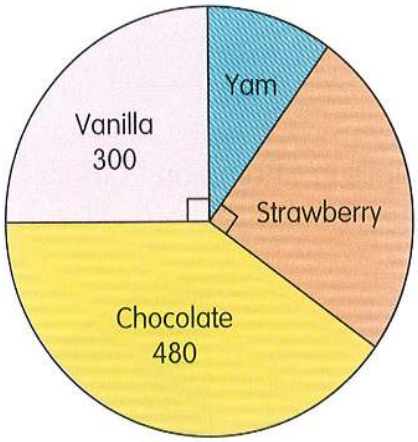
(a) What percentage of the school building fund was raised from Jumble sale?

(b) How much did the pupils raise from Jumble Sale?

(c) How many times as much money was raised from the food fair as games?

(d) What was the ratio of the amount of money pupils raised from the donation to the amount of money pupils raised from the food fair?

2 The pie chart shows the favourite ice cream of a group of children.



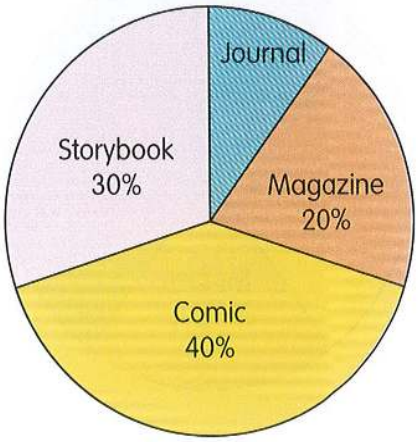
(a) How many children like strawberry ice creams?

(b) What fraction of the children like chocolate ice creams?

(c) What percentage of the total number of children like yam ice creams?

(d) What is the ratio of the number of children who like vanilla ice creams to the total number of children?

3 The pie chart shows the types of books in a library.
There are 800 comics in the library.



(a) What percentage of the books are journals?

(b) What fraction of the books are magazines?

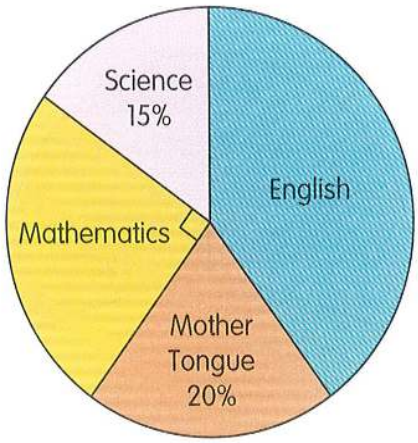
(c) Which type of books are twice as many as magazines?

(d) How many books are there in the library altogether?

(e) What is the ratio of the number of journals to the number of storybooks?

(f) How many journals are there in the library?

4 The pie chart shows the results of a survey on pupils' favourite subjects.

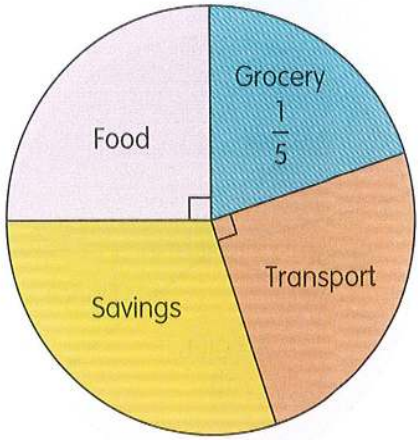


(a) What fraction of the pupils prefer Science?

(b) What is the ratio of the number of pupils who prefer Mathematics to the number of pupils who prefer English? Give the answer in the simplest form.

(c) There are 75 pupils who prefer science. How many pupils are there in the school?

5 The pie chart shows how Jen spends her salary in a month.

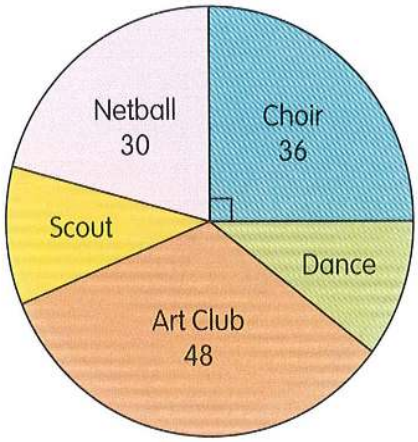


(a) What percentage of her salary does Jen save?

(b) Jen saves $570 more than what she spends on groceries. How much is her monthly salary?

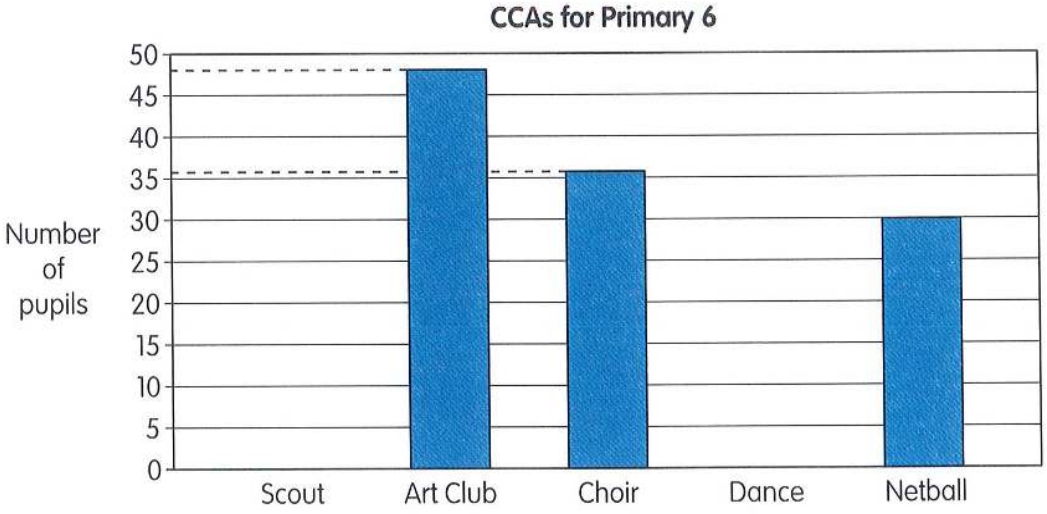
(c) How much does Jen spend on food and transport?

6 The pie chart shows the number of Primary 6 pupils in different Co-Curricular Activities (CCAs).



(a) What fraction of the total number of Primary 6 pupils join Netball?

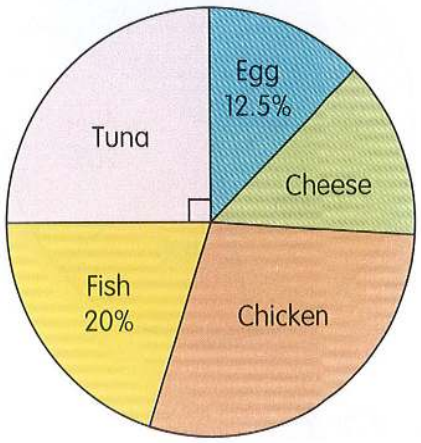
(b) The number of pupils who join Dance and Scout is the same.
Use the information from the pie chart to complete the bar graph.



Name: _____ Class: _____ Date: _____

L3 Worksheet 3

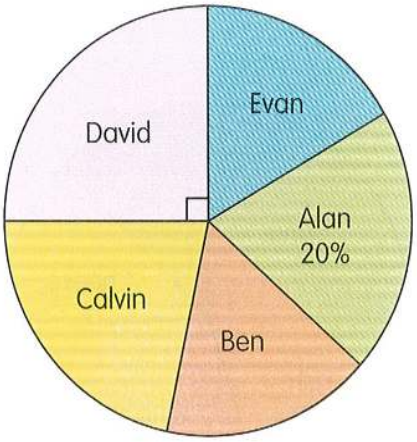
1 The pie chart shows the different types of sandwiches sold at a bakery.
A total of 1760 sandwiches were sold.
510 chicken sandwiches were sold.



(a) How many tuna sandwiches were sold?

(b) How many cheese sandwiches were sold?

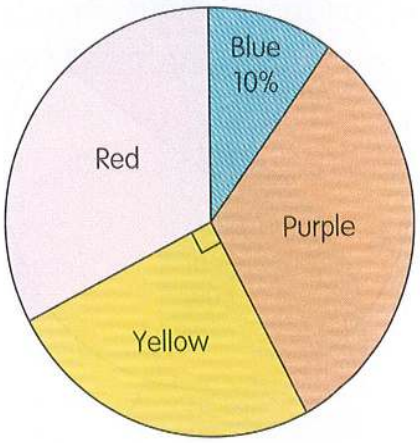
2 The pie chart shows the weekly salary of five men in a company.
The total salary of all the five men is $6000.
Evan's weekly salary is $1000.



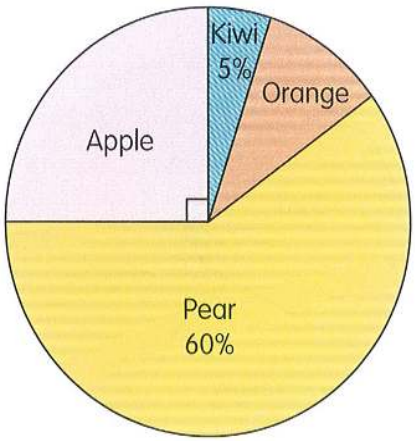
(a) What is David's weekly salary?

(b) If the weekly salaries of Ben and Calvin increase by 10%, what is the sum of their new salaries?

3 The pie chart shows the favourite colours of a group of pupils.
There are 130 pupils who like red and purple colours altogether.
How many pupils like yellow?



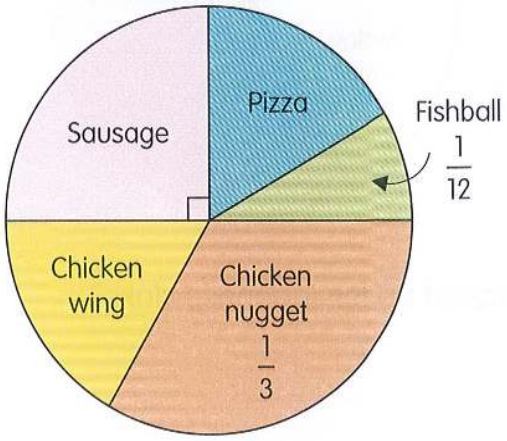
4 The pie chart shows the favourite fruits of 240 people.
How many more people choose pears than oranges as their favourite fruit?



Name: _____ Class: _____ Date: _____

L3 Problem Solving

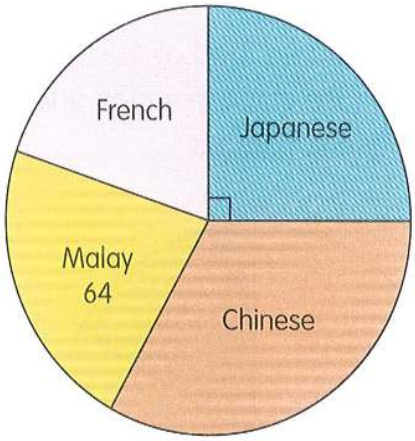
1. The pie chart represents the favourite food of the Primary 6 pupils in a school.
An equal number of pupils choose chicken wings and pizzas.
There are 48 pupils who choose sausages.



(a) What fraction of the pupils choose pizzas as their favourite food?

(b) How many pupils choose chicken nuggets as their favourite food?

2 The pie chart shows the types of language classes signed up by 288 adults.



(a) How many adults signed up for Japanese class?

(b) The number of adults who signed up for French class was $\frac{3}{5}$ of the number of adults who signed up for Chinese class. There were 64 adults who signed up for Malay class. How many adults signed up for Chinese class?

(c) What was the ratio of the number of adults who signed up for Malay class to the number of adults who signed up for the Japanese class?

Name: _____ Class: _____ Date: _____

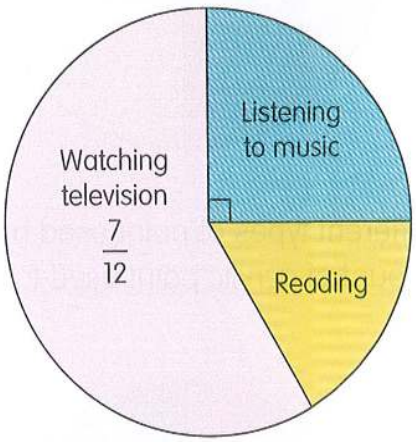
Self-Test (Duration: 30–45 minutes)

20

Section A: Multiple-Choice Questions (1 mark each)
For each question, four options are given. Choose the correct answer and write its number (1, 2, 3 or 4) in the brackets provided.

1. The pie chart represents the different activities that 36 teenagers do during their leisure time.
Find the number of teenagers who read during their leisure time.

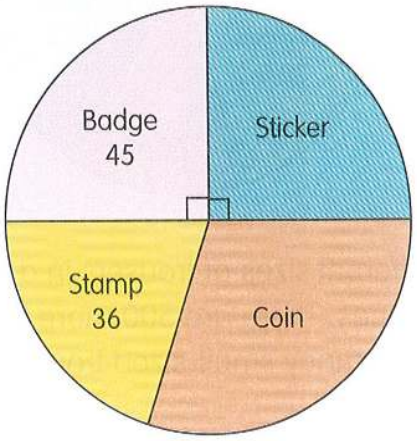
(1) 6
(2) 9
(3) 15
(4) 21



( )

2. The pie chart shows the items collected by 3 boys.
The 3 boys collected 45 badges and 36 stamps. How many coins did they collect?

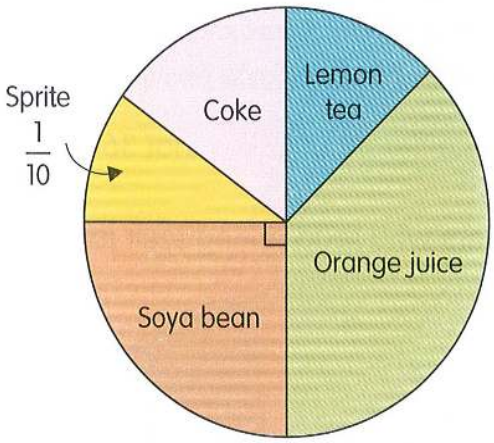
(1) 36
(2) 45
(3) 54
(4) 72



( )

3 The pie chart shows the different types of drinks sold at a drink stall.
There are 40 cans of soya bean drink. What is the number of cans of coke at the drink stall?

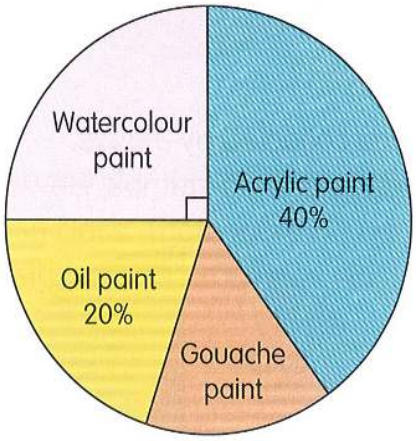
(1) 20
(2) 60
(3) 120
(4) 240



( )

4 The pie chart shows the different types of paint used by an artist.
What is the ratio of the amount of acrylic paint used to the amount of gouache paint used?

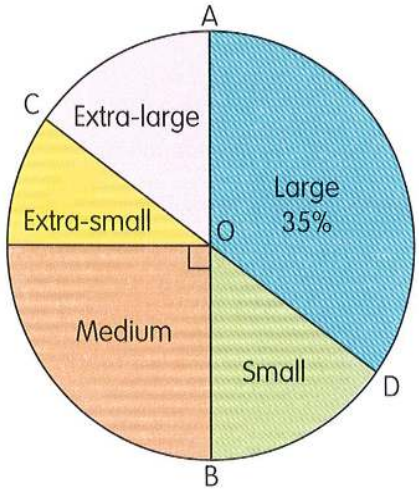
(1) 1 : 2
(2) 3 : 4
(3) 8 : 3
(4) 3 : 20



( )

5 The pie chart shows the different sizes of trousers in a shop.
AOB and COD are straight lines. There are 500 more large-sized trousers than medium-sized trousers. How many small-sized trousers are there?

(1) 50
(2) 75
(3) 750
(4) 1250

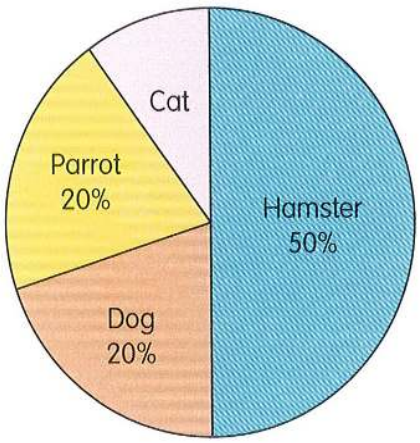


( )

Section B: Short-Answer Questions (8 marks)

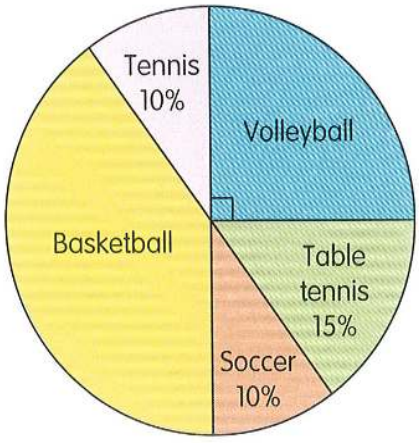
For each question, write your answer in the space provided. The number of marks available is shown in brackets [ ] at the end of each question.

6 A group of children was asked to name their favourite pets.
The pie chart shows their choices.
What fraction of the children chose cats as their favourite pet?



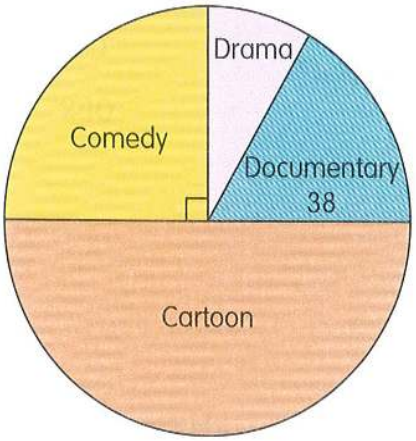
Ans: _____ [2]

7 A group of adults was asked to name their favourite sport.
The pie chart represents their choices.
There were 180 adults who liked volleyball. How many adults liked basketball?



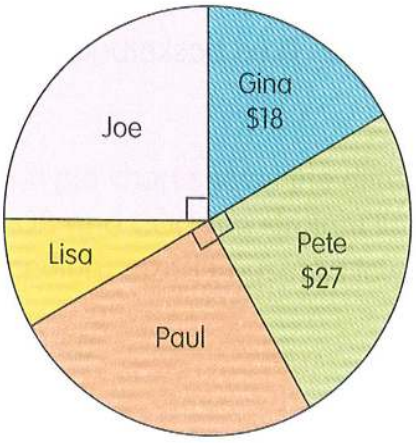
Ans: _____ [2]

8 The pie chart shows the favourite types of TV programmes of a group of people.
The ratio of the number of people who liked dramas to the number of people who liked documentaries is 1 : 2. There were 38 people who liked to watch documentaries.
How many people were there in all?



Ans: _____ [2]

9 The pie chart shows the amount of money spent by 5 pupils.
How much did Lisa spend?

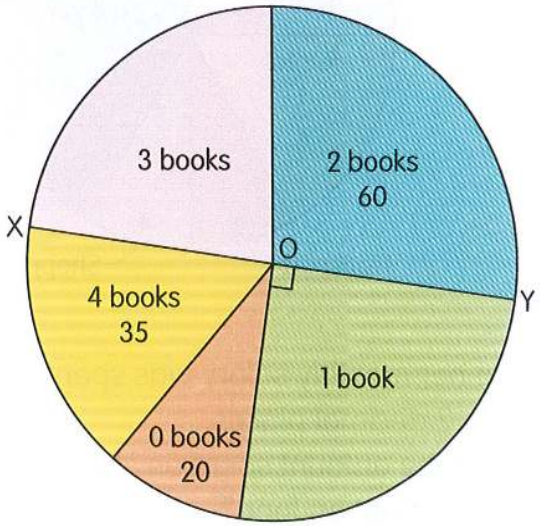


Ans: $ _____ [2]

Section C: Long-Structured Questions (7 marks)

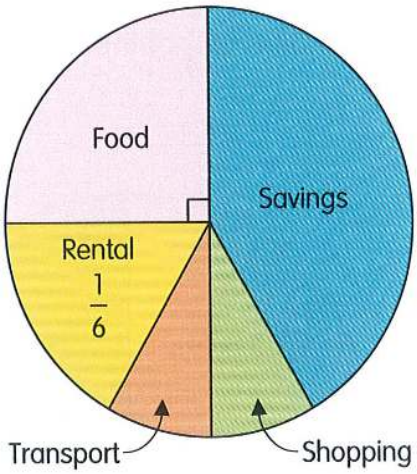
Show your working clearly. The number of marks available is shown in brackets [ ] at the end of each part-question.

10 The pie chart shows the number of books read in a month by Primary 6 pupils. XOY is a straight line. 60 pupils read 2 books in a month. Those who read 4 books and those who read 0 books make up $\frac{1}{4}$ of the number of Primary 6 pupils. How many pupils read at least 3 books?



Ans: _____ [3]

11 The pie chart shows how Jane spent her monthly salary.
She spent $\frac{1}{2}$ of her monthly salary on rental, food and transport. The amount she spent on shopping was the same as the amount she spent on transport.
She spent $240 on rental.



(a) What percentage of her monthly salary was spent on transport?
Round the answer to 2 decimal places.

(b) What was the ratio of the amount spent on shopping to the amount set aside for savings to the amount spent on food?
Give the answer in the simplest form.

Ans: (a) _____ % [2]

(b) _____ [2]

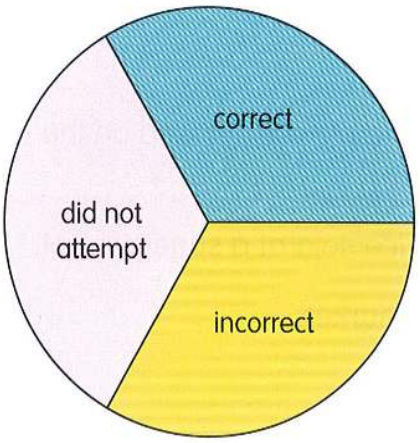
Name: _____ Class: _____ Date: _____

L3 Challenge (Let's Reason Mathematically)

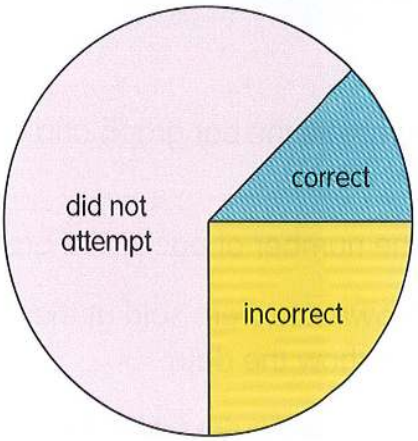
In a quiz, 100 pupils were asked to solve a challenging mathematics problem. There were 40 pupils who solved it correctly and 25 who solved it incorrectly. The rest of the pupils did not attempt to solve the problem.
Gopal, Hamid and Paul drew pie charts to show the data. Study each pie chart carefully.

Did the three boys draw the pie chart correctly? Explain why.

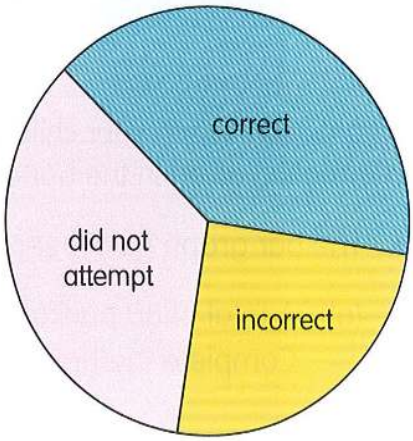
Gopal's pie chart



Hamid's pie chart



Paul's pie chart



Gopal's pie chart is (correct / incorrect).
Gopal's chart is (correct / incorrect) because _____

_____

Hamid's pie chart is (correct / incorrect).
Hamid's pie chart is (correct / incorrect) because _____

_____

Paul's pie chart is (correct / incorrect).
Paul's pie chart is (correct / incorrect) because _____

_____

Parent Pointers

Learning Outcomes

By the end of this chapter, your child should be able to do the following.

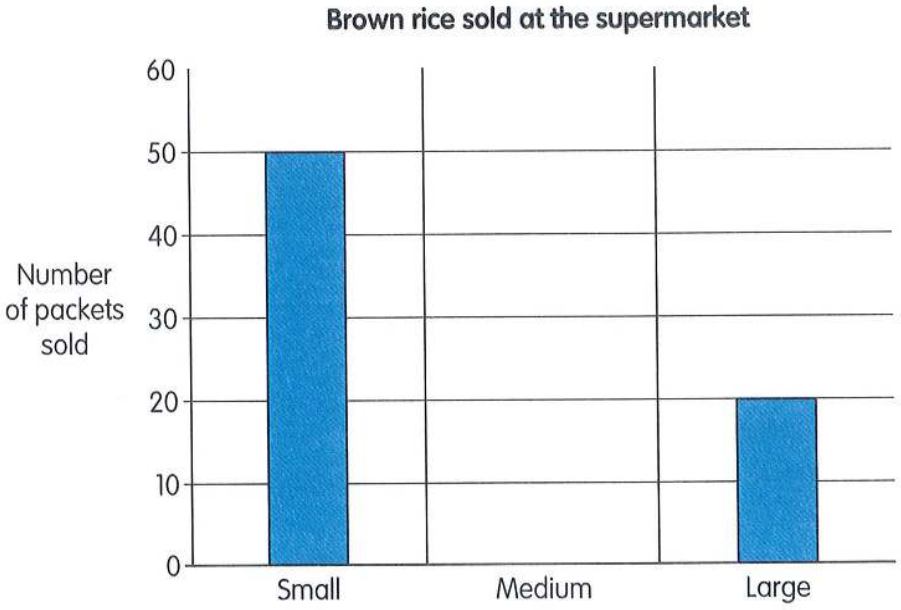
- Read and interpret data from pie charts
- Use the concept of proportionality to interpret data presented in pie charts in terms of percentages or fractions
- Solve problems using data from the pie charts and tables

Teach-At-Home Tips

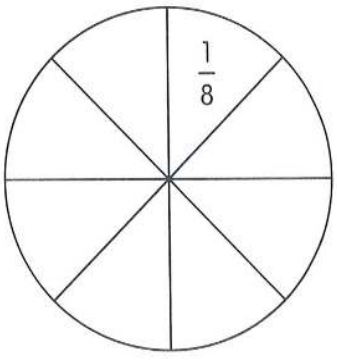
Parents can coach your child to complete the bar graph and draw the pie chart based on the information given in the bar graph.

- The bar graph below shows the number of packets of brown rice sold at a supermarket.

  (a) A total of 80 packets of brown rice were sold at the supermarket. Complete the bar graph to show the data.



  (b) Present the information in the given pie chart. Label the pie chart and use a different colour for each type of packet.



Name: _____ Class: _____ Date: _____

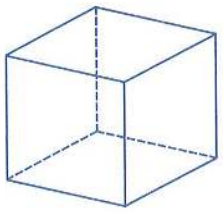
10 Solid Figures

Part 1 Cones, Cylinders, Prisms and Pyramids

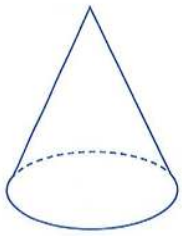
Worksheet 1

1 **Fill in the name of each solid figure in the box provided.**

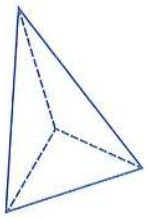
(a)



(b)

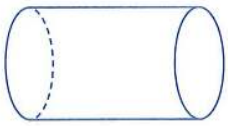


(c)

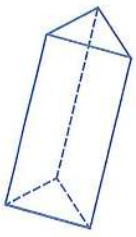


(d)

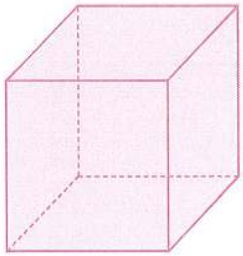
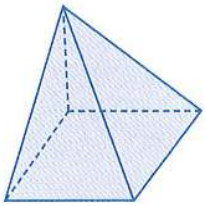
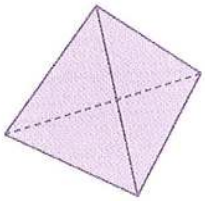
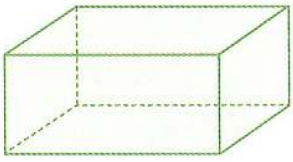
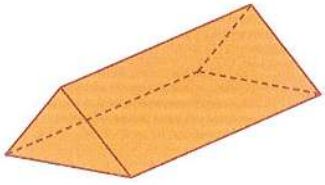
(e)



(f)



2 Write the number of faces, edges and vertices of each solid.

Solid	Number of faces	Number of edges	Number of vertices
(a) 			
(b) 			
(c) 			
(d) 			
(e) 			

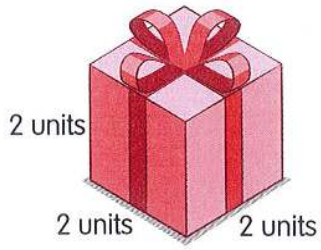
Name: _____ Class: _____ Date: _____

Part 2 Drawing Solid Figures on Isometric Grids

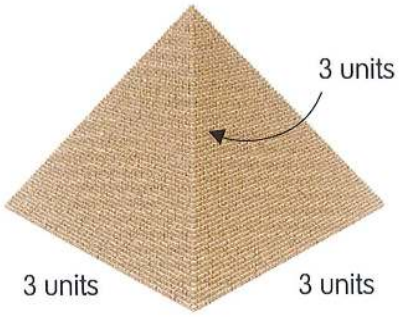
Worksheet 2

Draw each object on an isometric grid.

(a)



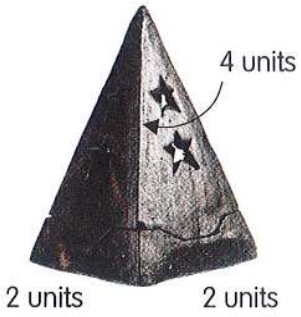
(b)



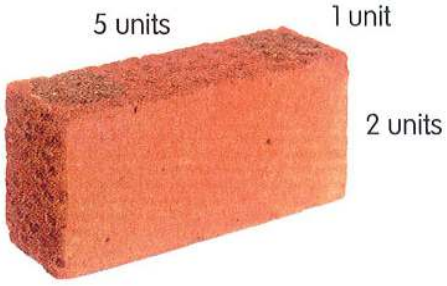
(c)

(d)

(e)



(f)

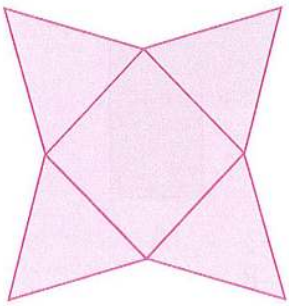


Name: _____ Class: _____ Date: _____

Part 3 Nets of Solids

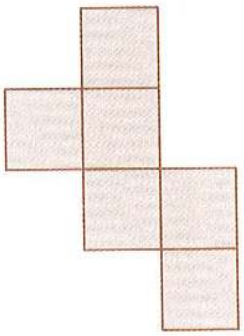
Worksheet 3

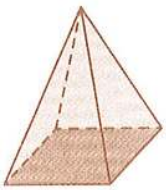
1. The diagram shows a net of a solid.
Name the solid formed by the net.

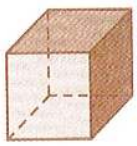


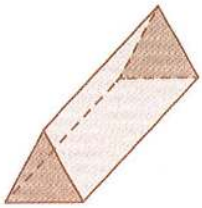
Ans: _____

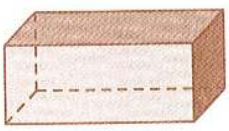
2. The diagram shows a net of a solid.
Which of the solid can be formed from the given net?
Tick [✔] in the box provided.



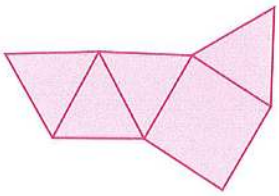




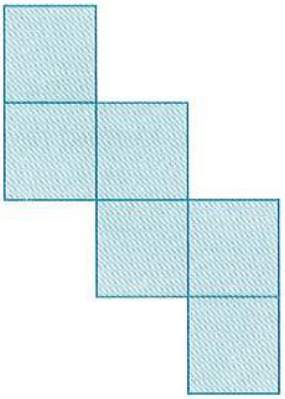




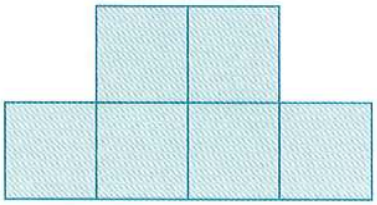
3 Which of the following nets can be folded to form a solid?
Circle the correct figures.



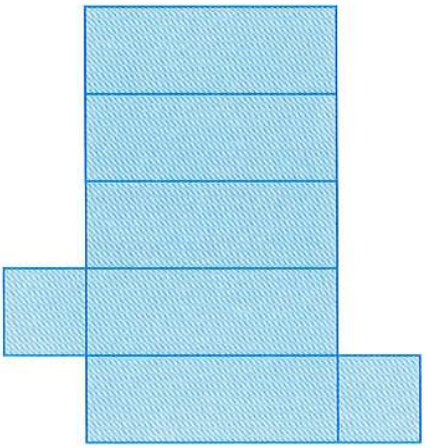
A



B



C

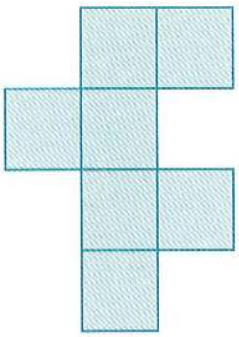


D

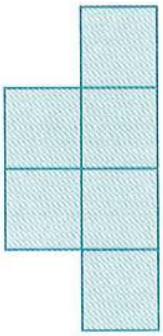
Name: _____ Class: _____ Date: _____

L2 Worksheet 4

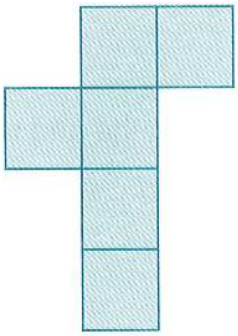
1. Which of the following is a net of a cube? Circle the correct figures.



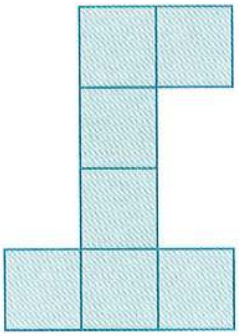
A



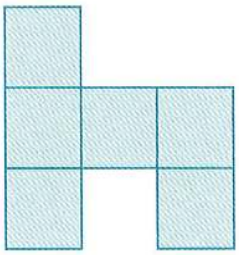
B



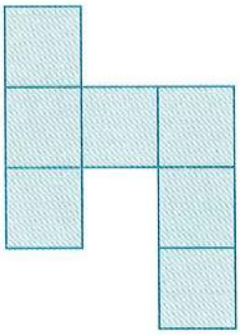
C



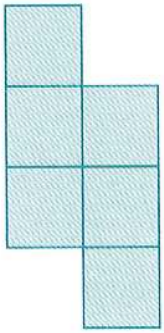
D



E

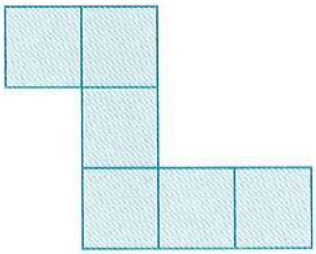


F

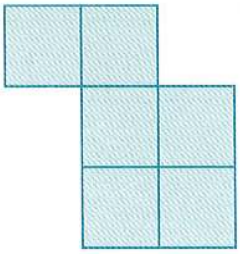


G

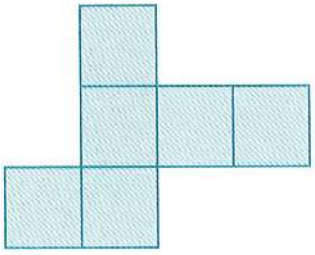
H



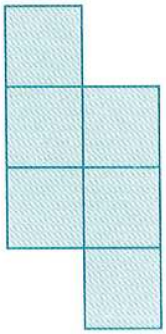
I



J



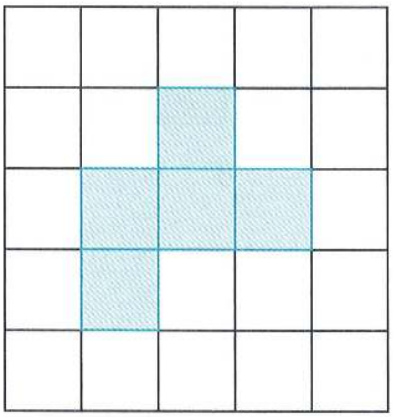
K



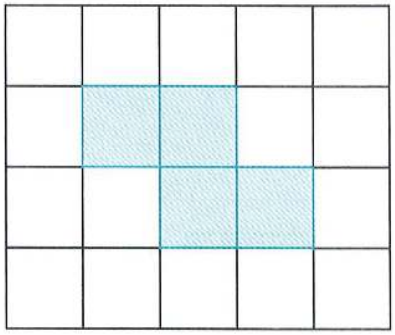
L

2 The figure shows a cube.

(a) Shade a square in the grid to complete the net of the cube.



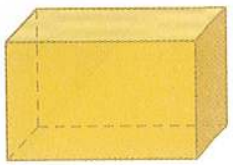
(b) Shade 2 more squares to form the net of a cube.



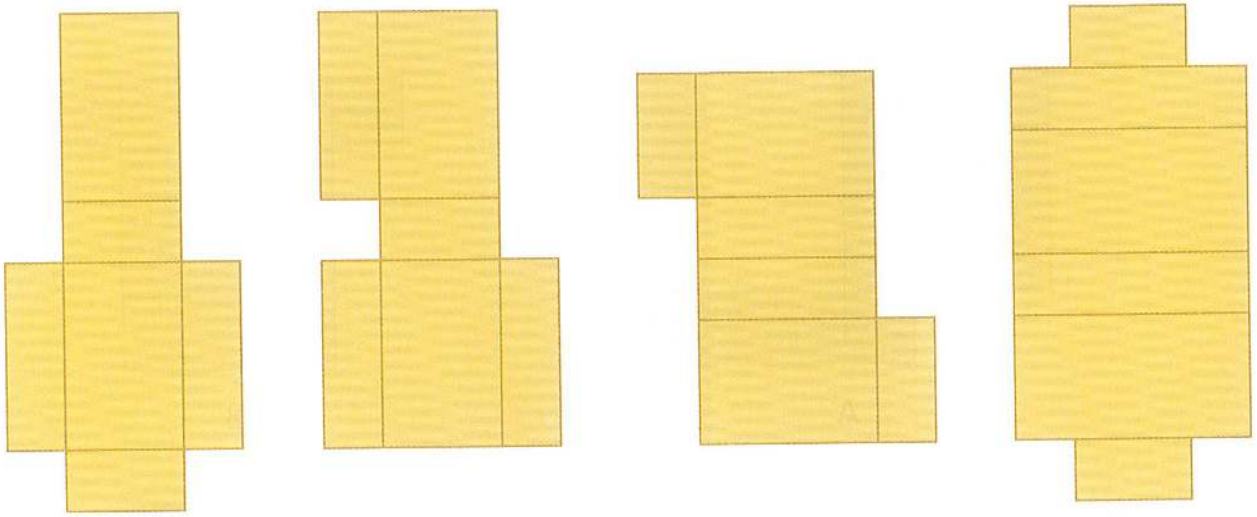
Name: _____ Class: _____ Date: _____

L2 Worksheet 5

1. The figure shows a cuboid.

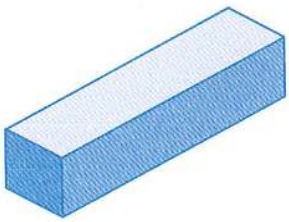


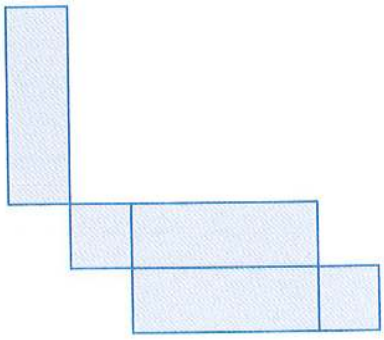
Which of the following is a net of the cuboid?
Circle the correct figure.



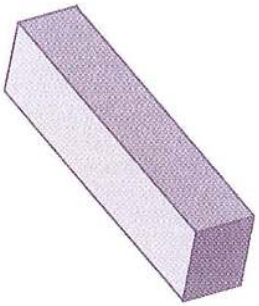
A B C D

2. The figure shows the net of the cuboid with a rectangular base.
One of the faces of the net is missing.
Complete the net by drawing the missing face.

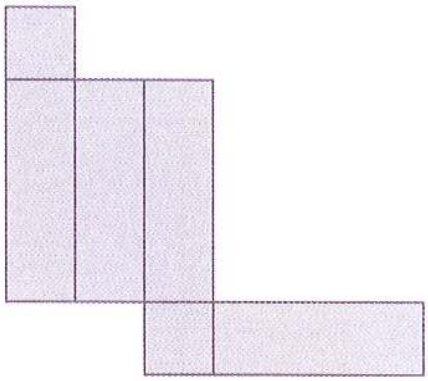




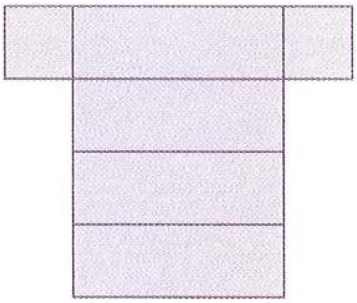
3 The figure shows a cuboid.



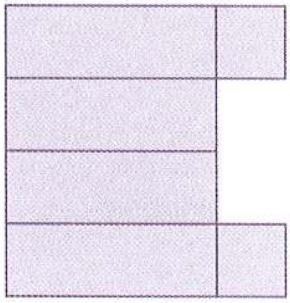
Which of the following is **not** a net of a cuboid?
Circle the incorrect figure.



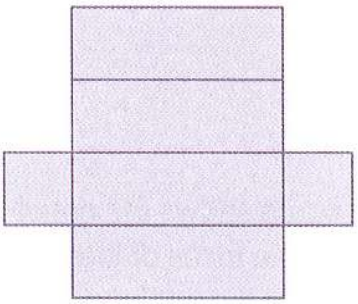
A



B



C



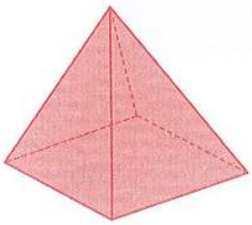
D

Name: _____ Class: _____ Date: _____

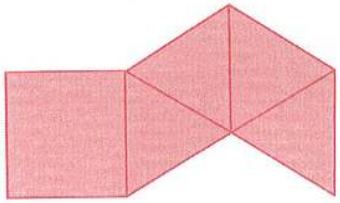
L3 Worksheet 6

Tick [✔] in the box provided.

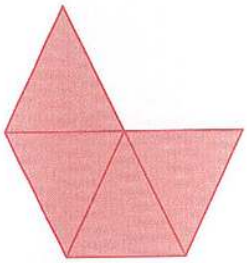
1. Which one of the following nets can be folded into a pyramid?



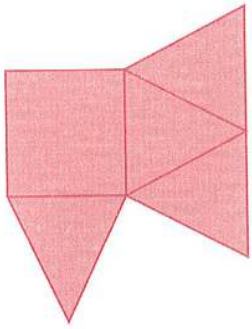
(a)



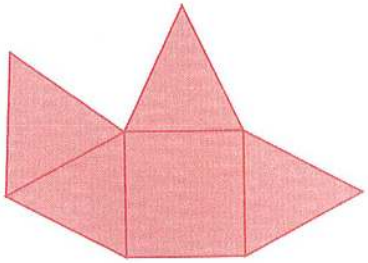
(b)



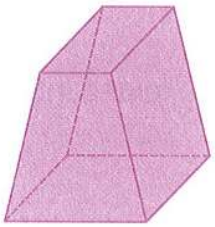
(c)



(d)

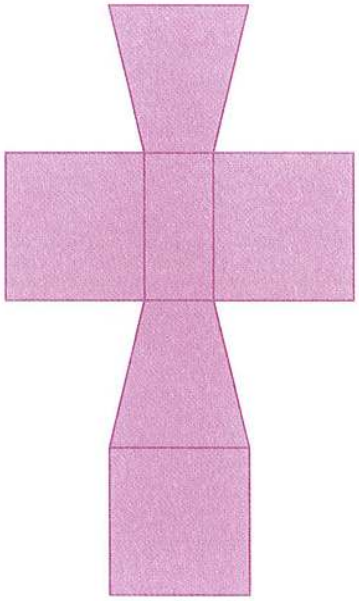


2 Which one of the following nets can be folded into a prism?

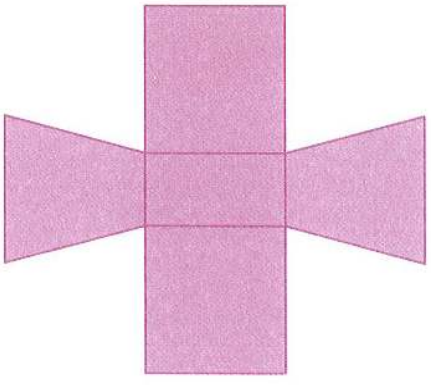


(a)

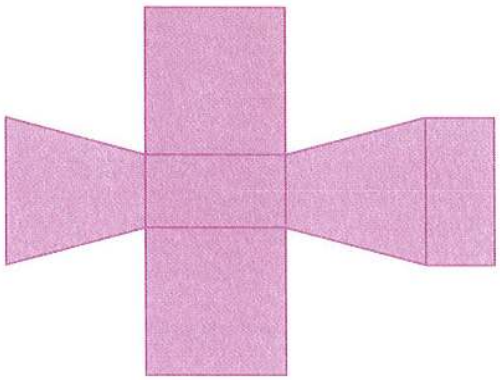
(b)



(c)

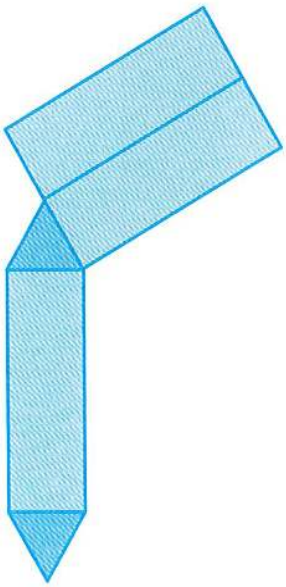


(d)

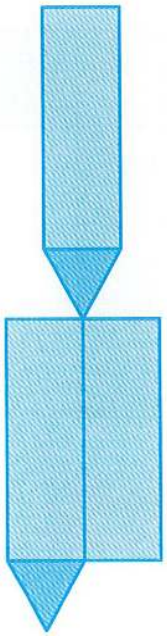


3 Which one of the following is **not** a net of the prism?

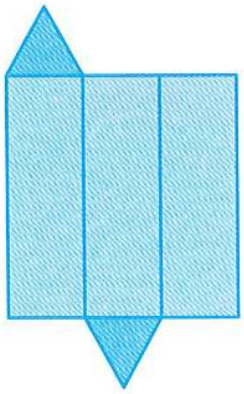
(a)



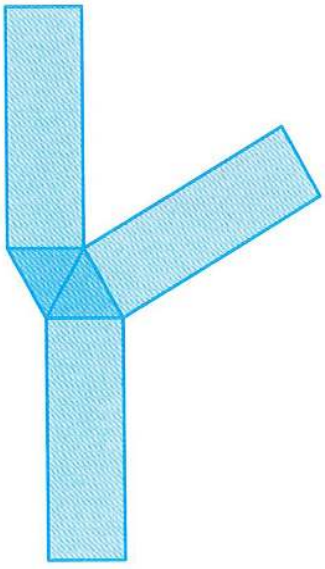
(b)



(c)

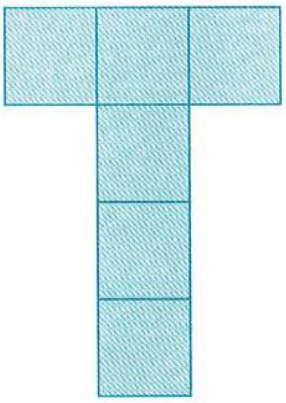


(d)

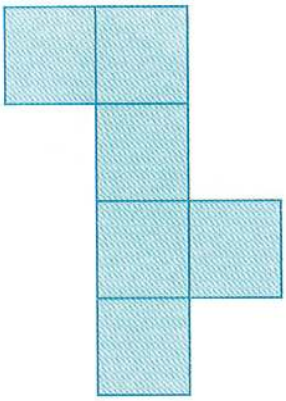


4 Which one of the following is **not** a net of the cube?

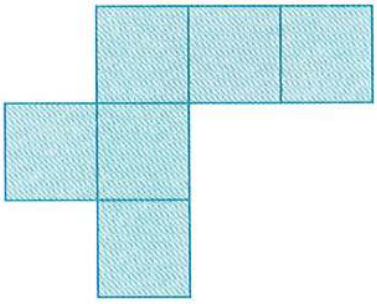
(a)



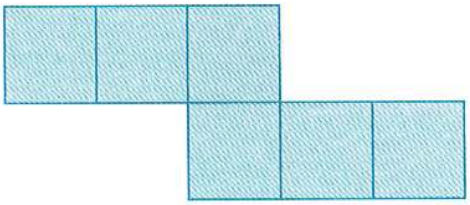
(b)



(c)



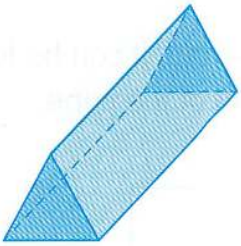
(d)



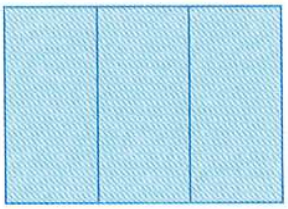
Name: _____ Class: _____ Date: _____

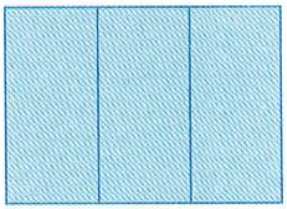
L3 Worksheet 7

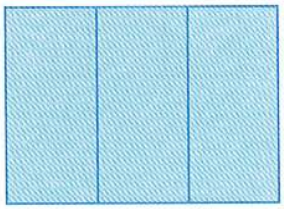
1 The figure shows a solid.

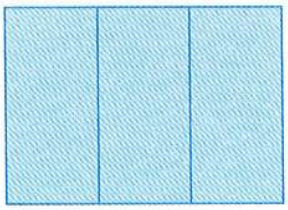


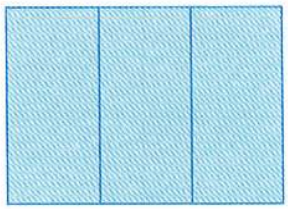
(a) Complete the six given nets so that it can be folded to form the solid. Draw the parts to show the net of the solid.

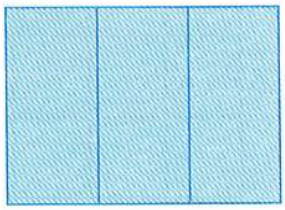










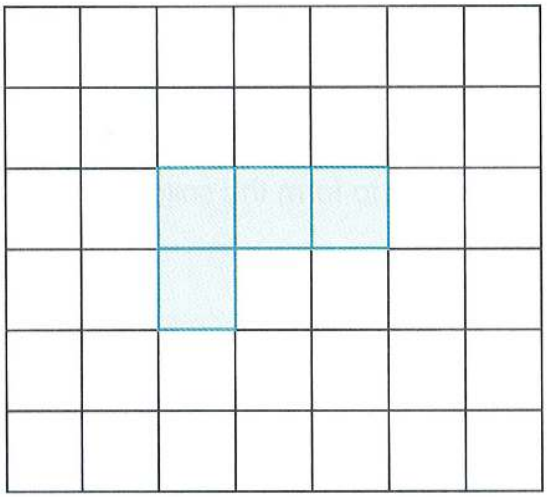


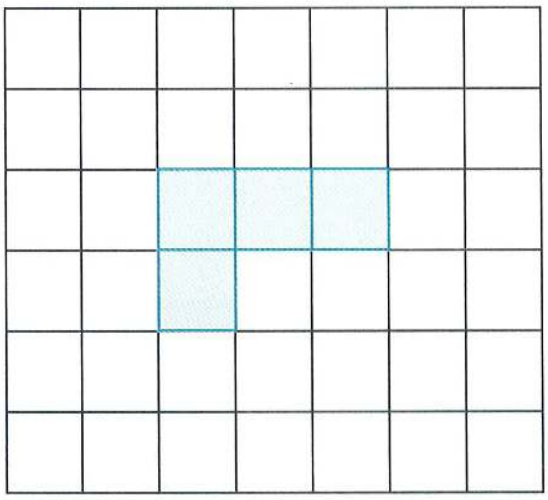
(b) How many faces does the solid have?

Ans: _____

2 The solid is a cube.

Complete the two given nets so that it can be folded to form the cube.
Shade the parts to show the net of the cube.

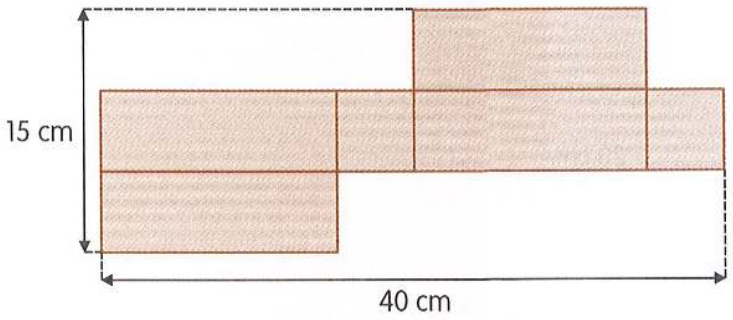




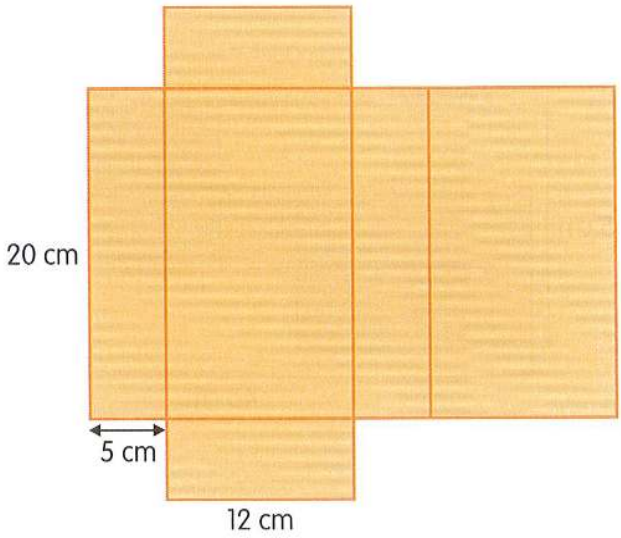
Name: _____ Class: _____ Date: _____

L3 Problem Solving

1. The figure shows the net of a cuboid with a square base.
What is the volume of the cuboid?



2 The figure shows the net of a solid.
Find the total surface area of the solid.
(**Hint**: surface area refers to the face area)



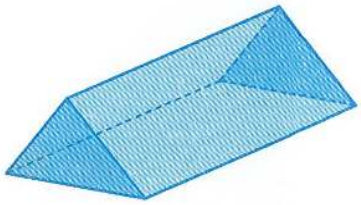
Name: _____ Class: _____ Date: _____

Self-Test (Duration: 30–45 minutes)

20

Section A: Multiple-Choice Questions (1 mark each)
For each question, four options are given. Choose the correct answer and write its number (1, 2, 3 or 4) in the brackets provided.

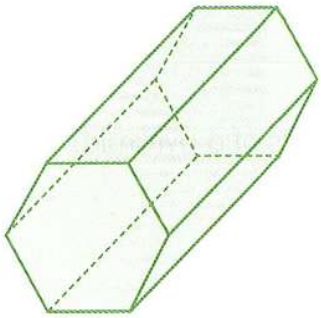
1. What is the name and the number of faces of the solid shown?



	Name	Number of faces
(1)	Prism	4 faces
(2)	Prism	5 faces
(3)	Pyramid	4 faces
(4)	Pyramid	5 faces

( )

2. How many rectangular faces does the prism have?

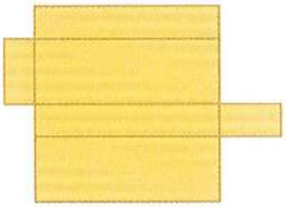


(1) 8
(2) 2
(3) 3
(4) 6

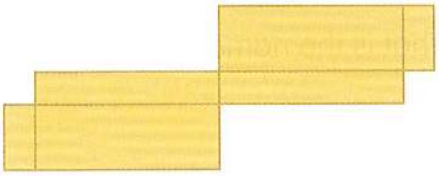
( )

3 Which one of the following figures is a net of the cuboid shown?

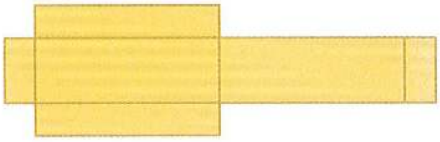
(1)



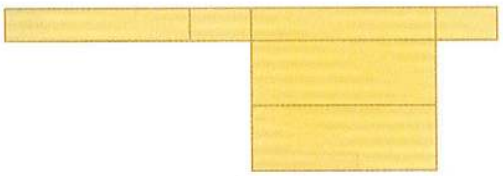
(2)



(3)

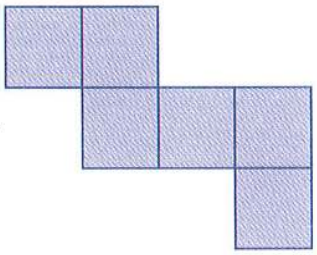


(4)

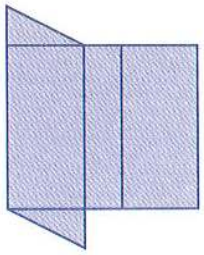


( )

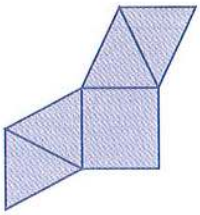
4 Which of the following is **not** the net of a solid?



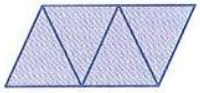
(1)



(2)



(3)

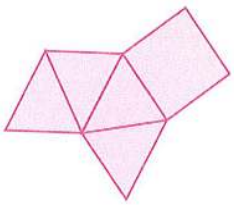


(4)

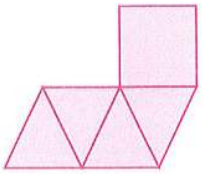
( )

5 Which of the following are the nets of a pyramid?

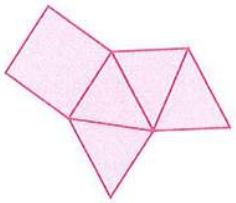
A



B



C



D

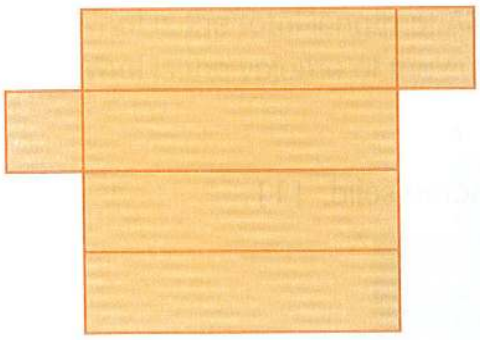
(1) A and C only
(2) A and D only
(3) B and C only
(4) B and D only

( )

Section B: Short-Answer Questions (7 marks)

For each question, write your answer in the space provided. The number of marks available is shown in brackets [ ] at the end of each question.

6 Name the solid formed by this net.



Ans: _____ [1]

7 Name the solid formed by this net.

Ans: _____ [1]

8 A solid figure has exactly 6 identical square faces.
What is the name of the solid figure?

Ans: _____ [1]

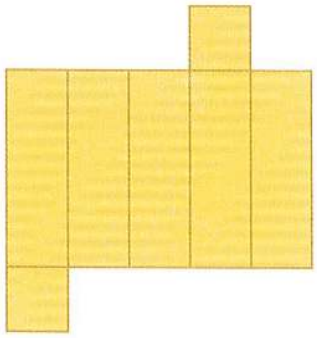
9 The figure shows a net of a solid.

Draw **one** triangle to show a different net for the same solid. [1]

10 The figure shows a prism.
What are the shapes of the faces that make up the prism?

Ans: _____ [2]

11 The figure shows an incorrect drawing of a net of a cuboid.
Put a cross [✘] on the net which is drawn wrongly. [1]



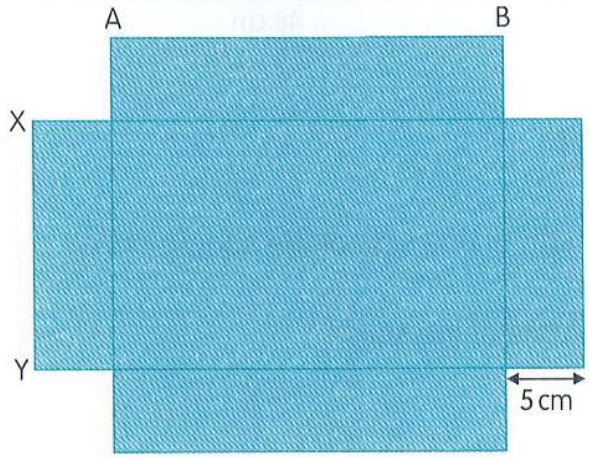
Section C: Long-Structured Questions (7 marks)

Show your working clearly. The number of marks available is shown in brackets [ ] at the end of each part-question.

12 The figure shows the net of a rectangular cuboid without a lid. The perimeter of the net is 120 cm. The ratio of the length of AB to the length of XY is 5 : 3.

(a) What is the total length of AB and XY?

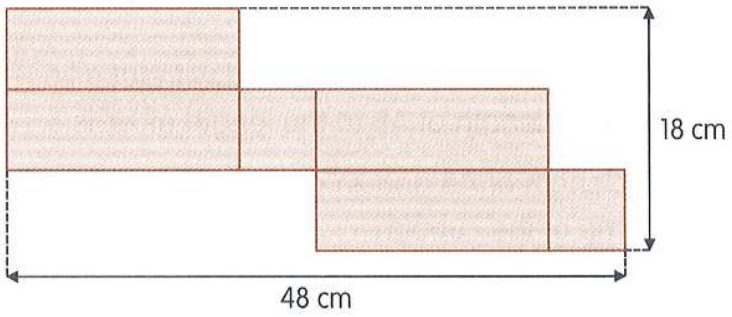
(b) What is the volume of the cuboid?



Ans: (a) _____ cm [2]

(b) _____ cm^3 [2]

13 The figure shows the net of a solid with a square base.



(a) Name the solid.

(b) What is the length of one side of the square base?

(c) What is the volume of the solid?

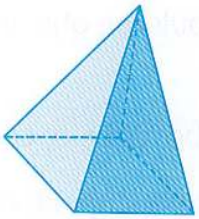
Ans: (a) _____ [1]

(b) _____ cm [1]

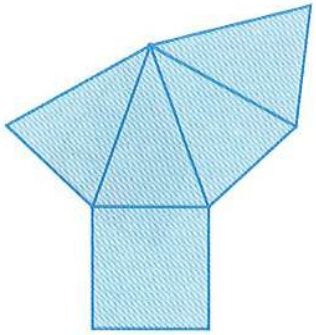
(c) _____ cm^3 [2]

Name: _____ Class: _____ Date: _____

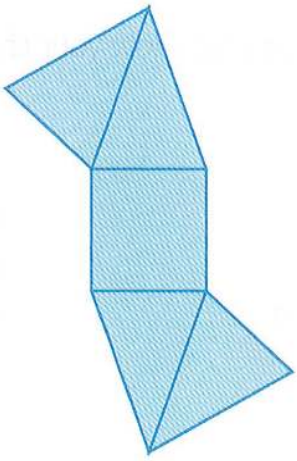
L3 Challenge (Let's Reason Mathematically)



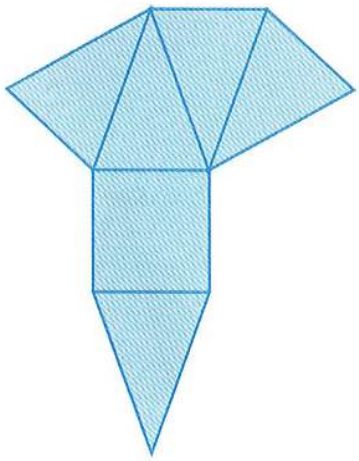
Which one of the following is a net of a square-base pyramid? Circle the figure.
Circle the figure which is not the net of a square-base pyramid.



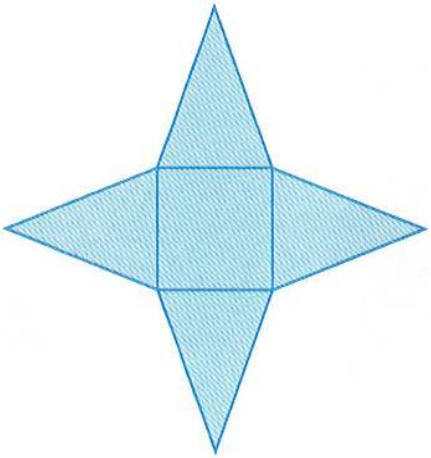
A



B



C



D

Figure (A / B / C / D) is not the net because _____

_____

Parent Pointers

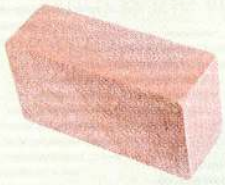
Learning Outcomes

By the end of this chapter, your child should be able to do the following.

- Identify 2D representations of cube, cuboid, cone, cylinder, prism and pyramid
- Identify the nets of 3D solids of cube, cuboid, prism and pyramid
- Identify the solid which can be formed by a given net

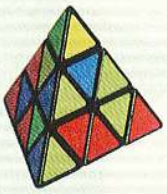
Teach-At-Home Tips

Parents can provide and show your child different 3D objects. Then classify each objects and complete the table.



A

B



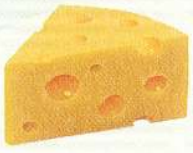
C

D

E

F

G



H

I

Classify the above objects. Write the letters in the correct column.

Pyramids	Prisms

Name: _____ Class: _____ Date: _____

Final Year Review

100

Paper 1

Section A (20 marks)

Questions **1** to **10** carry 1 mark each. Questions **11** to **15** carry 2 marks each.
For each question, four options are given. One of them is the correct answer.
Make your choice (1, 2, 3 or 4) and write its number in the brackets provided.

1 What does the digit 7 in 9.317 stand for?

(1) 7 ones
(2) 7 tenths
(3) 7 hundredths
(4) 7 thousandths ( )

2 $6.025 = 6 + \frac{5}{\square}$. The missing number in the box is _____.

(1) 100
(2) 125
(3) 200
(4) 250 ( )

3 Mrs Lim used $\frac{9}{10}$ hour kg of flour to bake 6 cupcakes. Find the mass of flour used to bake each cupcake.

(1) $\frac{3}{20}$ kg
(2) $\frac{1}{5}$ kg
(3) $3\frac{3}{5}$ kg
(4) $5\frac{3}{5}$ kg ( )

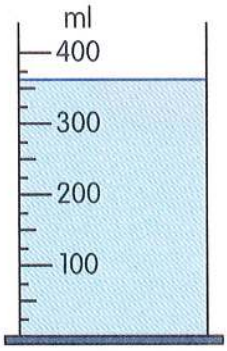
4 Which one of the following is **closest** to the volume of water shown?

(1) 330 ml

(2) 350 ml

(3) 360 ml

(4) 380 ml



( )

5 The length of each side of a square is an odd number. Which one of the following can be the perimeter of the square?

(1) 16 cm

(2) 25 cm

(3) 36 cm

(4) 64 cm

( )

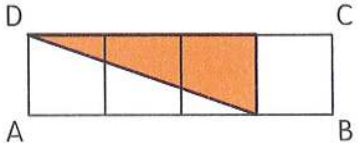
6 The figure ABCD is made up of 4 identical squares. What fraction of the figure is shaded?

(1) $\frac{1}{2}$

(2) $\frac{1}{3}$

(3) $\frac{2}{3}$

(4) $\frac{3}{8}$



( )

7 If 15% of a number is 12, what is $\frac{1}{4}$ of the number?

(1) 20

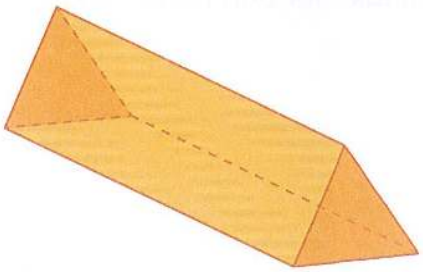
(2) 30

(3) 50

(4) 80

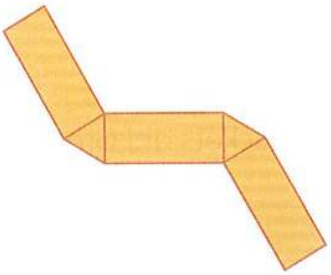
( )

8 The figure shows a prism.

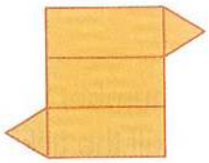


Which one of the following is **not** a net of a prism?

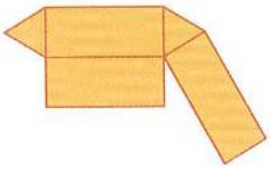
(1)



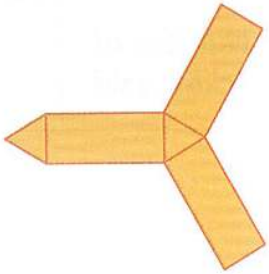
(2)



(3)



(4)



( )

9 Kelvin watched a movie which lasted $1\frac{3}{4}$ h. The movie ended at 1.30 a.m. What time did it start?

(1) 11 45

(2) 23 45

(3) 03 45

(4) 15 45

( )

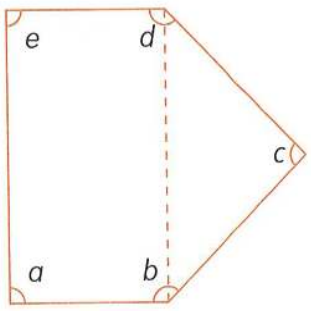
10 The figure is made up of a rectangle and a triangle.
Find the value of $\angle a + \angle b + \angle c + \angle d + \angle e$.

(1) 180°

(2) 360°

(3) 540°

(4) 720°



( )

11 Alex and Ben left Town A at the same time. Alex drove at 60 km/h while Ben drove at 90 km/h. How long would it take for Ben to be 90 km ahead of Alex?

(1) $\frac{1}{3}$ hour

(2) $\frac{2}{3}$ hour

(3) 1 hour

(4) 3 hours ( )

12 The table shows the number of tickets sold by three groups of volunteers.
Group A sold 25% of all the tickets. What percentage of the tickets did Group C sell?

Group	A	B	C
Number of tickets sold	40	88	?

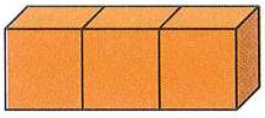
(1) 20%

(2) 32%

(3) 64%

(4) 75% ( )

13 The solid is made up of 3 identical cubes joined together.
The volume of the solid is 192 cm^3.



Peter paints all the faces of the solid. What is the total area of all the painted faces?

(1) 16 cm^2

(2) 64 cm^2

(3) 112 cm^2

(4) 224 cm^2 ( )

14 In a class, 60% of the students are girls. 5% of the girls and 20% of the boys walk to school. What percentage of the students in the class walk to school?

(1) 10%

(2) 11%

(3) 14%

(4) 25% ( )

15 The ratio of the number of girls to the number of boys who joined a Science club was 5 : 7. When 24 girls left the club, the new enrolment decreased to $\frac{3}{4}$ of its original number of students. How many girls joined the Science club at first?

(1) 16

(2) 32

(3) 40

(4) 72 ( )

Section B (25 marks)

Questions **16** to **20** carry 1 mark each. Write your answers in the spaces provided. For questions which require units, give your answers in the units stated.

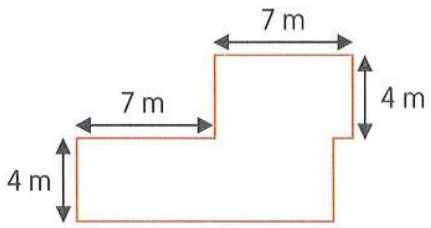
16 How many eighths are there in $5\frac{1}{4}$?

Ans: _____

17 Mrs Tan started driving from 10 30 to 14 15 on the same day.
How long did she drive?

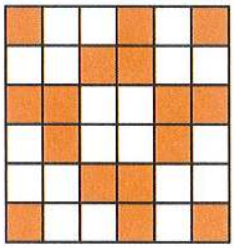
Ans: _____ h

18 Find the perimeter of the figure.



Ans: _____ m

19 How many lines of symmetry does the figure have?



Ans: _____

20 The average of 3 numbers is 54. Two of the numbers are 35 and 67.
What is the third number?

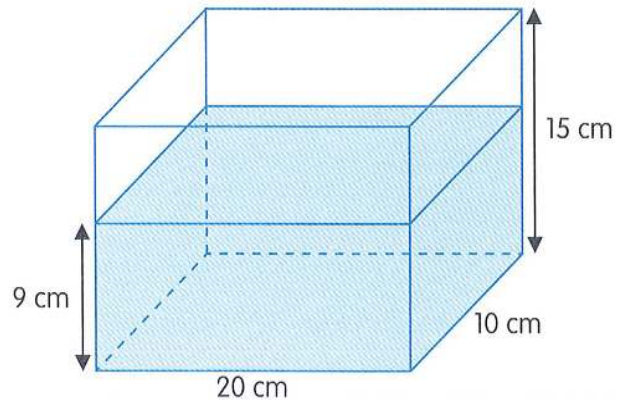
Ans: _____

Questions **21** to **30** carry 2 marks each. Show your working clearly and write your answers in the spaces provided. For questions which require units, give your answers in the units stated.

21 $\frac{5}{12}$ of the marbles in a box are blue. Half of the marbles are red. There are 150 more red marbles than blue marbles. The rest of the marbles are yellow. What is the total number of marbles in the box?

Ans: _____

22 A rectangular container measuring 20 cm long by 10 cm by 15 cm is filled with water to a height of 9 cm. What is the increase in the height of the water level when the tank is $\frac{2}{3}$ full?



Ans: _____ cm

23 The table shows the postage rates for delivering parcels in a certain city.

Mass	Postage
For the first 2 kg	$6
For every additional 100 g and part thereof	$0.10

The mass of John's parcel is 3 kg when rounded to the nearest whole number. What is the **least** possible amount he has to pay to send out this parcel?

Ans: $ _____

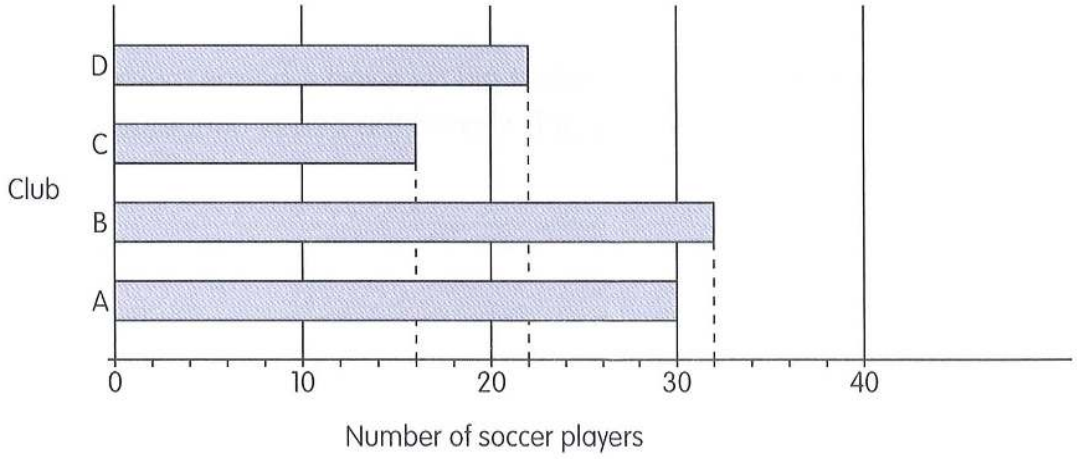
24 In a baking class, there were 3 more women than men. Each man baked 4 cookies and each woman baked 7 cookies. The total number of cookies baked by the women was 45 more than the total number of cookies baked by the men. How many men baked the cookies?

Ans: _____

25 At a concert, 20% of the audience were adults. 25% of the remainder were boys and the rest were girls. There were 480 girls. How many adults were there at the concert?

Ans: _____

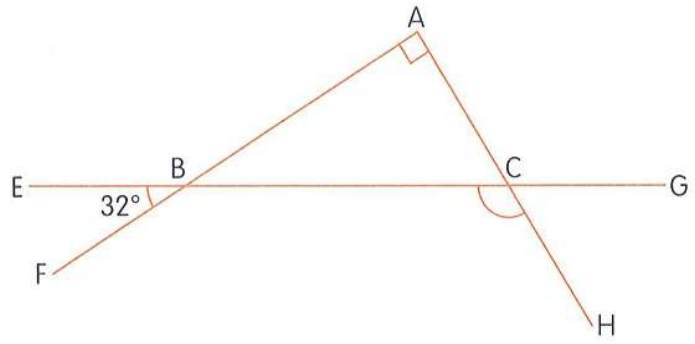
26 The bar chart shows the number of soccer players in 4 different clubs.



What fraction of the total number of soccer players are from Club A?
Give the answer in the simplest form.

Ans: _____

27 BAC is a right-angled triangle. EBCG, ABF and ACH are straight lines.
Find ∠BCH.



Ans: _____ °

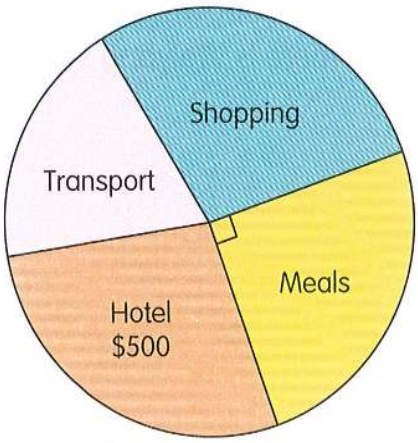
28 Some girls shared 140 beads. The eldest girl received 4 beads more while the rest received 8 beads each. How many girls shared the beads altogether?

Ans: _____

29 Ling bought 2 cans of tea and 2 packets of popcorn. One can of tea cost $\$w$.
One packet of popcorn cost \$3 more than one can of tea.
How much did she spend in all?

Ans: \$ _____

30 The pie chart shows how Jane spent her money during a holiday. She spent a total of \$1800. She spent 50% more on shopping than on transport. How much did she spend on transport?



Ans: \$ _____

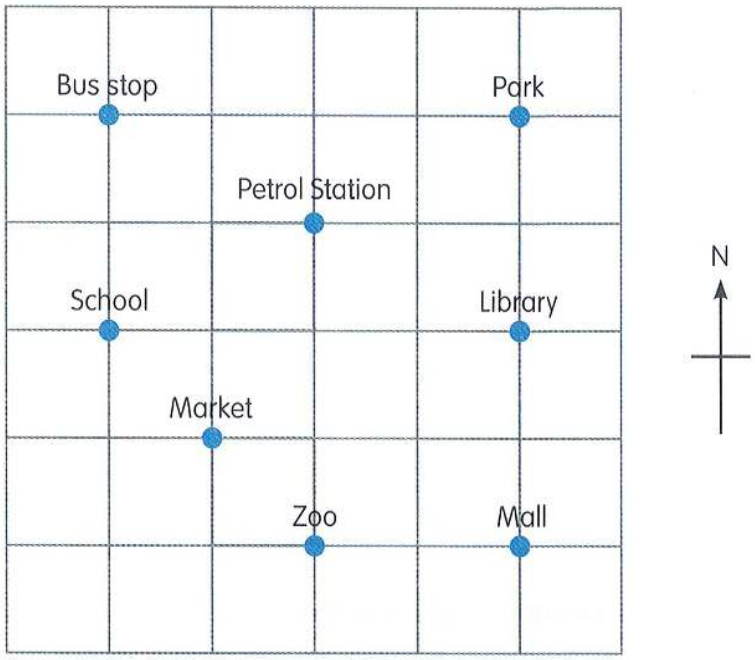
End of Paper 1

Paper 2

Section A (10 marks)

Questions **1** to **5** carry 2 marks each. Show your working clearly and write your answers in the spaces provided. For questions with units, give your answers in the units stated.

1 The square grid shows the plan of a neighbourhood. The petrol station is north of the zoo.



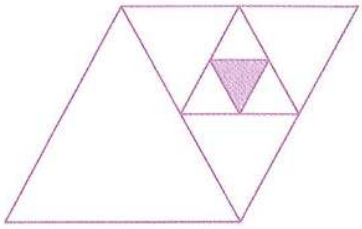
(a) In what direction is the bus stop from the park?

(b) Weiyang is standing at a particular place. When he turns south-west, he will face the zoo. When he turns west, he will face the school. Where is Weiyang standing?

Ans: (a) _____

(b) _____

2 The figure is made up of equilateral triangles of different sizes. The area of the shaded triangle is 6 cm^2. What is the area of the figure?



Ans: _____ cm^2

3 Paul's present age is a multiple of 4. Next year, his age will be a multiple of 3. Paul is more than 36 years old but less than 55 years old now. How old is he now?

Ans: _____

4 Mr Lim spent $\$(m + 525)$ from his salary. He gave half of his remaining salary to his wife and gave the rest to his 3 children equally. Each child got $\$m$. Mr Lim salary's was \$4900. Find the value of m.

Ans: _____

5 John spent $\frac{1}{6}$ of his monthly allowance on food, $\frac{1}{3}$ of the remainder on bus fare and \$180 on rent. Then he had \$450 left. How much did he spend on bus fare?

Ans: \$ _____

Section B (45 marks)

For questions **6** to **17**, show your working clearly and write your answers in the spaces provided. The number of marks available is shown in brackets [ ] at the end of each question or part question.

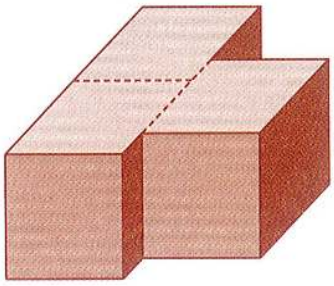
6 Karen and Amiya shared a sum of money in the ratio 2 : 3. After Amiya gave $30 to Karen, the ratio of Karen's share to Amiya's share became 11 : 4. How much money did Amiya have in the end?

Ans: $ _____ [3]

7 A carpenter dipped the solid below into a pail of paint. The solid was then cut into 3 identical cubes along the dotted lines and separated apart. The total unpainted area of the 3 cubes was 324 cm^2.

(a) How many faces were unpainted after the 3 cubes were separated apart?

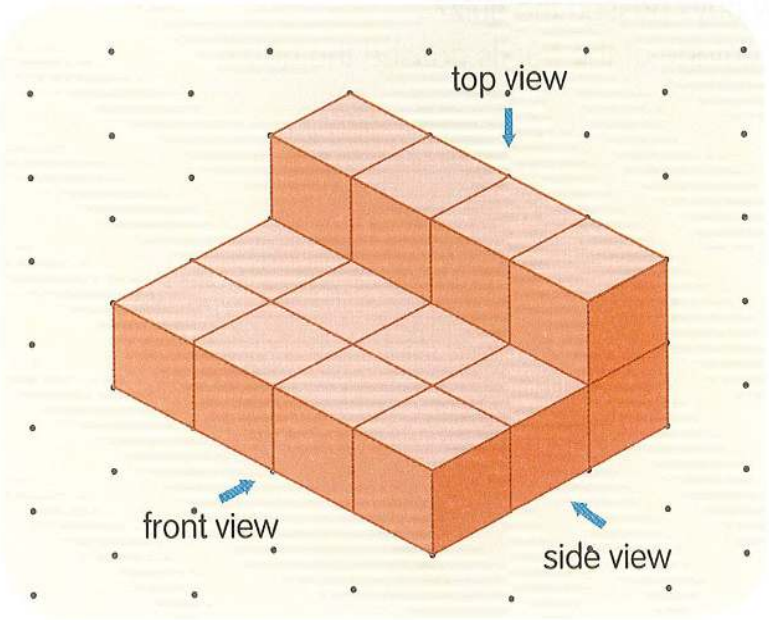
(b) What was the volume of each cube?



Ans: (a) _____ [1]

(b) _____ cm^3 [2]

8 Draw on the square grid the front view, top view and side view of given solid. [3]



Top View

Front View

Side View

9 200 pupils in a school sat for a quiz. 40% were girls. 80% of the girls and 60% of the boys passed the quiz.

(a) How many boys passed the quiz?

(b) What percentage of the pupils passed the quiz?

Ans: (a) _____ [2]

(b) _____ % [2]

10 The figure shows the promotion for lollipops at a candy shop.

(a) Meiling needs 160 lollipops for a party. What is the least number of lollipops she should buy?

(b) How much does she need to pay?

Ans: (a) _____ [2]

(b) $ _____ [2]

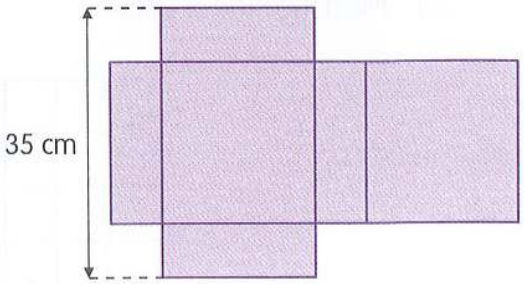
11 The average of four numbers A, B, C and D is 81. When A is decreased by 80, B is tripled, C is increased by 16 and D is halved, all the four numbers become equal. What is the value of A?

Ans:_____ [3]

12 The diagram shows the net of a cuboid. The cuboid has a square base. The height of the cuboid is $\frac{1}{3}$ of the length of the base.

(a) What is the length of the cuboid?

(b) Find the volume of the cuboid.



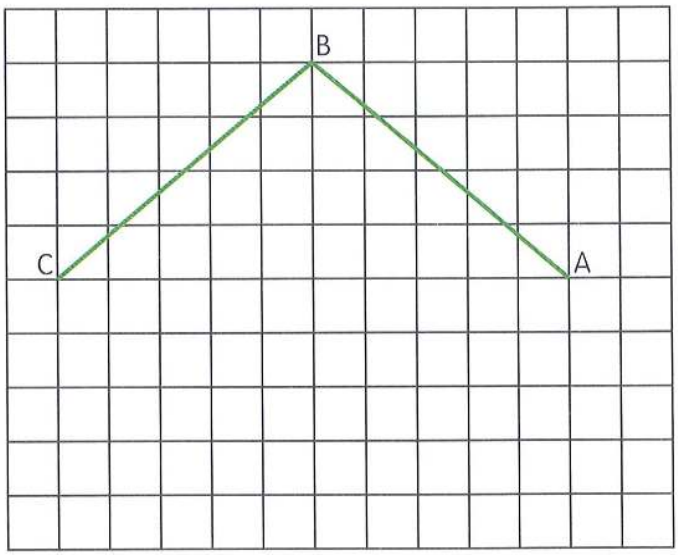
Ans: (a) _____ cm [1]

(b) _____ cm^3 [2]

13 In the square grid, two sides of a rhombus ABCD have been drawn.

(a) Complete the drawing of the rhombus ABCD. [2]

(b) Measure the ∠DAB.

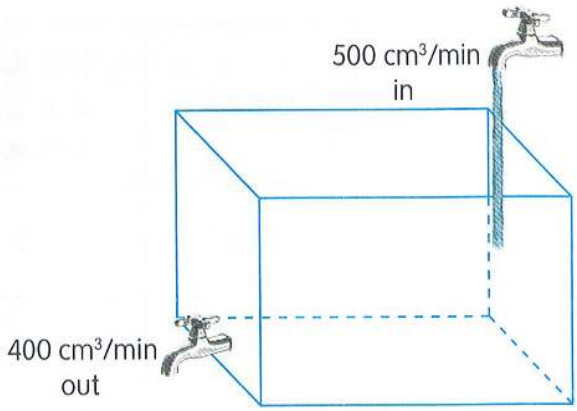


Ans: _____° [1]

14 A container of capacity 20 litres is being filled with water at a rate of 500 cm^3 per minute. After 15 minutes, another tap is turned on, draining the tank at a rate of 400 cm^3 per minute.

(a) Find the volume of water in the tank after 15 minutes.

(b) What is the total time taken to fill the water to the brim?



Ans: (a) _____ cm^3 [1]

(b) _____ min [3]

15 The table shows the results of 2 girls who took part in a quiz. 3 marks were awarded for each correct answer and 2 marks were deducted for each wrong answer. If a question was not answered, no point was awarded or deducted. Due to some ink spillage, one of the numbers cannot be seen.

Name	Number of wrong answers	Number of questions not answered	Points awarded
Mei	25	0	70
Ling	13		103

(a) How many questions were there in the quiz?

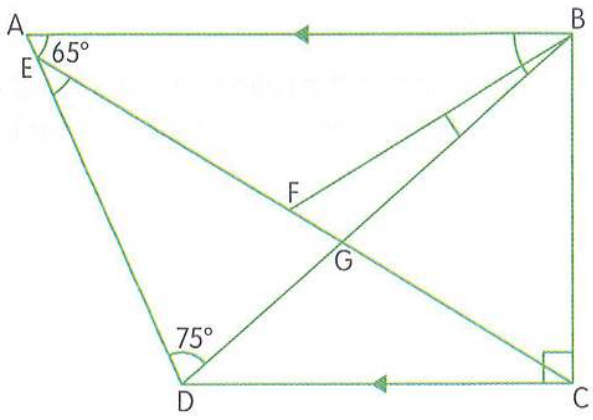
(b) How many questions Ling did not answer?

Ans: (a) _____ [3]

(b) _____ [2]

16 In the figure, EFGC and DGB are straight lines and BA is parallel to CD. BCF is an equilateral triangle. $\angle DAB = 65°$ and $\angle BDA = 75°$.

(a) Find $\angle ABD$.
(b) Find $\angle FBG$.
(c) Find $\angle DEC$.



Ans: (a) _____° [1]

(b) _____° [2]

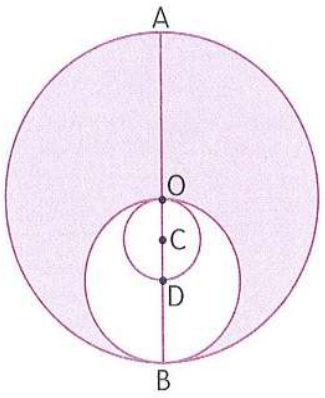
(c) _____° [2]

17 Jane drew three circles to form a figure. The radius of the smallest circle, OC, is 4 cm. OD is the radius of the medium-sized circle and OB is the radius of the biggest circle.

(Take $\pi = \frac{22}{7}$)

(a) What is the ratio of the area of the biggest circle to the area of the smallest circle?

(b) What is the area of the shaded figure?



Ans: (a) _____ [3]

(b) _____ cm^2 [2]

End of Paper 2

Answers

7 Speed

Part 1: Speed

Worksheet 1

1. (a) 120 km/h
   (b) 50 km/h
   (c) 160 km/h
   (d) B
   (e) C
   (f) 120
   (g) 360
   (h) 50
   (i) 250

2. Distance ÷ Speed
   Distance ÷ Time
   Speed × Time

3. 70, 70

4. (a) 6 (b) 50 (c) 2

5. (a) Lorry A takes a longer time than Lorry B to travel the same distance.

Lorry A travels at a faster speed than Lorry B	
Lorry A travels at a slower speed than Lorry B	✔
Lorry B travels at a faster speed than Lorry A	✔
Lorry A and Lorry B travel at the same speed	

(b) Lorry A travels a longer distance than Lorry B in 1 hour.

Lorry A travels at a faster speed than Lorry B	✔
Lorry A travels at a slower speed than Lorry B	
Lorry B travels at a slower speed than Lorry A	✔
Lorry A and Lorry B travel at the same speed	

Part 2: Finding Speed, Distance and Time

Worksheet 2

1. Speed of motorist = 180 ÷ 3
   = 60 km/h

2. 30 min = $\frac{1}{2}$ h
   Speed of bird = $15 \div \frac{1}{2}$
   $= 15 \times \frac{2}{1}$
   = 30 km/h

3. David's cycling speed = $10 \div \frac{2}{3}$
   $= 10 \times \frac{3}{2}$
   = 15 km/h

4. From 18 20 to 19 10, 50 minutes had passed.
   Janice's jogging speed = 2700 ÷ 50
   = 54 m/min

5. Distance travelled = 20 × 4
   = 80 km

6. Time taken = 360 ÷ 180
   = 2 min

7. From 6.40 a.m. to 7.05 a.m., 25 minutes have passed.
   James's cycling speed = 1500 ÷ 25
   = 60 m/min

8. From 22 15 to 05 15, 7 hours have passed.
   Speed of train = 628 ÷ 7
   ≈ 89.714 km/h
   = 89.7 km/h (to 1 decimal place)

Part 3: Word Problems (Involving Speed with Two Parts in a Journey)

Worksheet 3

1. Time taken by Alice = 3 h 40 min + 20 min
   = 4 h

   Speed of airplane Alice was travelling in = 2574 ÷ 4
   = 643.5 km/h

2. First part of distance travelled = 82 × 2
   = 164 km

   Second part of distance travelled = 60 × 1
   = 60 km

   Total distance travelled = 164 + 60
   = 224 km

3. Distance jogged by John = $10 \times 1\frac{1}{2}$
   = 15 km

   Distance jogged by Peter = 27 – 15
   = 12 km

   Peter's jogging speed = $12 \div 1\frac{1}{2}$
   $= 12 \times \frac{2}{3}$
   = 8 km/h

4. Distance to City A = 90 × 2
   = 180 km

   At a speed of 60 km/h, time taken = 180 ÷ 60
   = 3 h

   3 – 2 = 1
   Mr Tang would take 1 h more to reach City A.

Worksheet 4

1. (a) Time taken by Mr Lim to reach library = 3000 ÷ 120
= 25 min

25 min after 16 45 was 17 10.
2 h 15 min after 17 10 was 19 25.
He left the library at 19 25 or 7.25 p.m.

(b) Mr Lim's speed for journey back home = 3000 ÷ 50
= 60 m/min

2. Distance for $\frac{1}{5}$ of journey = $\frac{1}{3} \times 60$
= 20 km

Distance for $\frac{4}{5}$ of journey = 20 × 4
= 80 km

Mr Chen's speed from City B to City C = $80 \div \frac{50}{60}$
= $80 \times \frac{60}{50}$
= 96 km/h

Part 4: Average Speed

Worksheet 5

1. Total distance jogged = 1500 + 1800
= 3300 m

Total time taken = 13 + 20
= 33 min

Jane's average speed = 3300 ÷ 33
= 100 m/min

2. **Method 1**

80 km ⟶ 60 min
20 km ⟶ 60 min ÷ 4 = 15 min
The motorcyclist will need 15 minutes.

Method 2

80 km ⟶ 1 h

20 km ⟶ $\frac{1}{4}$ h = 15 min

The motorcyclist will need 15 minutes.

3. Total distance jogged = 6.5 + 3.5
= 10 km

Total time taken = 30 + 20
= 50 min
= $\frac{50}{60}$ h
= $\frac{5}{6}$ h

Ahmad's average jogging speed = $10 \div \frac{5}{6}$
= $10 \times \frac{6}{5}$
= 12 km/h

4. Total distance driven = 90 + 35
= 125 km

Total time taken = $1\frac{1}{2} + \frac{1}{2}$
= 2 h

Noreen's average driving speed = 125 ÷ 2
= 62.5 km/h

Part 5: Word Problems (Involving Speed with Two Moving Objects)

Worksheet 6

1. Time taken = 420 ÷ 70
= 6 h

6 hours after 09 00 is 15 00 or 3 p.m.
The car will arrive in Kuala Lumpur at 15 00 or 3 p.m.

2. **Method 1**

10 km ⟶ 1 h or 10 km ⟶ 60 min

2 km ⟶ $\frac{1}{5}$ h = 12 min 2 km ⟶ 60 min ÷ 5 = 12 min

12 min before 7.20 p.m. is 7.08 p.m. or 19 08.
David must set off at 7.08 p.m. or 19 08.

Method 2

Time = $\frac{\text{Distance}}{\text{Speed}}$
= $\frac{2}{10}$ h
= $\frac{1}{5}$ h
= 12 min

12 min before 7.20 p.m. is 7.08 p.m. or 19 08.
David must set off at 7.08 p.m. or 19 08.

3. $70 \times 2\frac{1}{2} = 175$

$84 \times 3\frac{1}{2} = 294$

Total distance travelled = 175 + 294
= 469 km

Total time taken = $2\frac{1}{2} + 3\frac{1}{2}$
= 6 h

Average speed = 469 ÷ 6
= $78\frac{1}{6}$ km/h

Worksheet 7

1. 40 min = $\frac{40}{60}$ h
= $\frac{2}{3}$ h

Distance jogged by Beth = $\frac{2}{3} \times 6$
= 4 km

Distance jogged by Amy = 7 – 4
= 3 km

Amy's jogging speed = $3 \div \frac{2}{3}$
= $3 \times \frac{3}{2}$
= 4.5 km/h

2. Distance covered by both vehicles in 1 hour = 70 + 50
= 120 km

Time taken to meet = 480 ÷ 120
= 4 h

4 h after 8 a.m. is 12 noon.
2 vehicles pass each other at 12 noon.

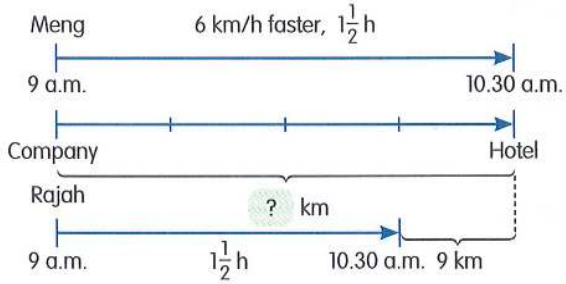
3. Time taken by Roy = 420 ÷ 70
= 6 min

Time taken by his sister = 6 – 2
= 4 min

Distance travelled by his sister = 60 × 4
= 240 m

420 – 240 = 180
His sister was 180 m away from post office.

4.



For every 1 h, Meng drove 6 km further than Rajah.
For every $\frac{1}{2}$ h, Meng drove 3 km further than Rajah.
For $1\frac{1}{2}$ h, Meng drove 9 km further than Rajah.

$\frac{1}{4}$ of total distance ⟶ 9 km
$\frac{4}{4}$ of total distance ⟶ 9 × 4 = 36 km

Distance between their company and hotel was 36 km.

Worksheet 8

1. (a) Time taken to travel remaining journey = $\frac{3}{5} \times 2\frac{1}{2}$
= $1\frac{1}{2}$ h
= 90 min

(b) $\frac{3}{5}$ of journey ⟶ 156 km
$\frac{1}{5}$ of journey ⟶ 156 ÷ 3 = 52 km
$\frac{5}{5}$ of journey ⟶ 52 × 5 = 260 km
Total distance travelled was 260 km.

$2\frac{1}{2} + 1\frac{1}{2} = 4$
Total time taken was 4 h.

260 ÷ 4 = 65
Ken's average speed was 65 km/h.

2. (a) Distance between their house and Evergreen Park
= $9 \times \frac{50}{60}$
= 7.5 km

(b) Distance that her brother cycles = 7.5 – 3
= 4.5 km

Her brother cycles at 7.35 a.m.
Duration till 8 a.m. is 25 min.

Her brother's cycling speed = $4.5 \div \frac{25}{60}$
= $4.5 \times \frac{60}{25}$
= 10.8 km/h

3. $\frac{3}{4}$ of journey ⟶ 75 × 3 = 225 km
$\frac{1}{4}$ of journey ⟶ 225 ÷ 3 = 75 km
$\frac{4}{4}$ of journey ⟶ 75 × 4 = 300 km
Total distance was 300 km.

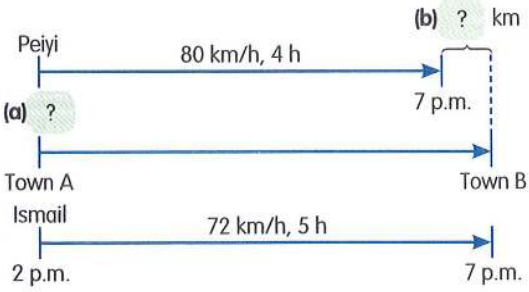
300 ÷ 80 = 3.75
Total time taken was 3.75 h.

Time taken for first quarter of journey = 3.75 – 3
= 0.75 h

Distance for first quarter of journey = 300 – 225
= 75 km

Average speed for first quarter of journey = 75 ÷ 0.75
= 100 km/h

4.



(a) Time taken by Peiyi = 5 – 1
= 4 h
4 h before 7 p.m. is 3 p.m. or 15 00.
Peiyi leaves Town A at 3 p.m. or 15 00.

(b) Peiyi's distance = 80 × 4
= 320 km

Ismail's distance = 72 × 5
= 360 km

360 – 320 = 40
Peiyi is 40 km away from Ismail at 7 p.m.

Problem Solving

1. (a) 2 km → 20 min
1 km → 20 ÷ 2 = 10 min
9 km → 9 × 10 = 90 min
= 1 h 30 min

1 h 30 min before 9.10 a.m. is 7.40 a.m. or 07 40.
The race starts at 7.40 a.m. or 07 40.

(b) 6 km → 6 × 10 = 60 min
Siti uses 60 min for the remaining 6-km race.

60 – 20 = 40
Ravi uses 40 min for the remaining 6-km race.

Ravi's speed for remaining 6 km race = $6 \div \frac{40}{60}$
$= 6 \times \frac{60}{40}$
= 9 km/h

2. (a) Agnes
2 min = 120 s
Her speed = 400 ÷ 120
$= 3\frac{1}{3}$ m/s
At 45 seconds, distance travelled by her = $3\frac{1}{3} \times 45$
= 150 m

Bryan
$1\frac{1}{2}$ min = 90 s
His speed = 400 ÷ 90
$= 4\frac{4}{9}$ m/s
At 45 seconds, distance travelled by him = $4\frac{4}{9} \times 45$
= 200 m

Distance between them after 45 seconds = 200 – 150
= 50 m

(b)

	Time Taken			
	1st round	**2nd round**	**3rd round**	**4th round**
Agnes	120 s	240 s	**360 s**	480 s
Bryan	90 s	180 s	270 s	**360 s**

Bryan ran 4 complete rounds.

Self-Test

Section A

1. (2) 2. (4) 3. (2) 4. (1) 5. (3)

Section B

6. 2 m = 200 cm
Time taken = 200 ÷ 40
= 5 s
$= \frac{1}{12}$ min

7. Distance covered by Mei in 1 hour = 30 × 60
= 1800 m

Distance covered by Shanti in 1 hour = 50 × 60
= 3000 m

Distance between them = 3000 – 1800
= 1200 m
= 1.2 km

8. 1st part of journey travelled = $72 \times 1\frac{1}{2}$
= 108 km

Total distance travelled = 108 + 12
= 120 km

Total time taken = $1\frac{1}{2} + \frac{1}{2}$
= 2 h

Average speed = 120 ÷ 2
= 60 km/h

9. In 1 min, total distance covered by both children
= 75 + 85
= 160 m

Time taken to pass each other = 960 ÷ 160
= 6 min

Distance walked by James = 6 × 75
= 450 m

Section C

10. (a) Duration between 10.45 a.m. and 12 noon was $1\frac{1}{4}$ h.

At 12 noon, distance travelled by Henry = $6 \times 1\frac{1}{4}$
= 7.5 km

(b) At 12 noon, distance travelled by Alex = $8 \times 1\frac{1}{4}$
= 10 km

Distance between Town A and Town B = 10 + 7.5 + 2
= 19.5 km

11. (a) $80 \times \frac{1}{2} = 40$

Train A has travelled 40 km.

(b) At 11 p.m., remaining distance = 550 – 40
= 510 km

Total speed for both trains = 90 + 80
= 170 km/h

Duration for both train to pass each other = 510 ÷ 170
= 3 h

3 h after 11 p.m. is 2 a.m. or 02 00.
Both trains pass each other at 2 a.m. or 02 00.

Challenge

(a) Distance that Ben drove = $70 \times \frac{1}{2}$
= 35 km

(b) Fraction of journey that Alan and Calvin drove
$= \frac{1}{3} + \frac{1}{4}$
$= \frac{4}{12} + \frac{3}{12}$
$= \frac{7}{12}$

Fraction of journey that Ben drove = $\frac{12}{12} - \frac{7}{12}$
$= \frac{5}{12}$

$\frac{5}{12}$ of distance → 35 km
$\frac{1}{12}$ of distance → 35 ÷ 5 = 7 km
$\frac{4}{12}$ of distance → 4 × 7 = 28 km

$28 \div 80 = \frac{7}{20}$

Alan drove for $\frac{7}{20}$ h or 21 min.

(c) $\frac{12}{12}$ of distance → 12 × 7 = 84 km

I do not agree as total distance is 84 km which is less than 100 km.

8 Volume

Part 1: Finding an Edge of a Cuboid

Worksheet 1

1. (a) Unknown edge = 160 ÷ (8 × 4)
= 5 cm

(b) Unknown edge = 1920 ÷ (24 × 8)
= 10 cm

2. Unknown side = 495 ÷ (15 × 11)
= 3 cm

3. (a) Unknown edge = 2700 ÷ 300
= 9 cm

(b) Unknown edge = 288 ÷ 48
= 6 m

4. Area of shaded face = 2730 ÷ 14
= 195 cm^2

Part 2: Finding an Edge of a Cube

Worksheet 2

1. (a) 8
(b) 12
(c) 16
(d) 20

2. (a) 10
(b) 9
(c) 15
(d) 23

3. (a) Length of one edge = $\sqrt{225}$
= 15 cm

(b) Length of one edge = $\sqrt{49}$
= 7 m

4. (a) Length of one edge = $\sqrt[3]{343}$
= 7 cm

(b) Length of one edge = $\sqrt[3]{64}$
= 4 m

5. Length = $\sqrt[3]{512}$
= 8 cm
Area of shaded face = 8 × 8
= 64 cm^2

6. Length of Cube A = $\sqrt[3]{27}$
= 3 cm
Length of Cube B = 3 × 3
= 9 cm
Volume of Cube B = 9 × 9 × 9
= 729 cm^3

Part 3: Word Problems

Worksheet 3

1. (a) Area of square base = 720 ÷ 5
= 144 cm^2

(b) Length of square base = $\sqrt{144}$
= 12 cm

2. (a) Breadth = 2 × 3
= 6 cm
Shaded area = 6 × 3
= 18 cm^2

(b) Length = 3 × 3
= 9 cm
Volume of cuboid = 18 × 9
= 162 cm^3

3. Volume of one cube = 1512 ÷ 7
= 216 cm^3
Length of one cube = $\sqrt[3]{216}$
= 6 cm
Height of figure = 6 × 4
= 24 cm

4. Unpainted area of one cube = 250 ÷ 10
= 25 cm^2
Length of one cube = $\sqrt{25}$
= 5 cm
Volume of each cube = 5 × 5 × 5
= 125 cm^3

Worksheet 4

1. Capacity of Tank A = 40 × 10 × 20
= 8000 cm^3
Volume of water in Tank A = 8000 ÷ 2
= 4000 cm^3
Capacity of Tank B = 60 × 10 × 40
= 24 000 cm^3
24 000 – 4000 = 20 000
20 000 cm^3 = 20 litres

20 litres of water are needed to fill up Tank B to its brim.

2. Capacity of tank = 80 × 40 × 50
= 160 000 cm^3
= 160 litres

$160 \div 6 = 26\frac{2}{3}$
= 27 min (to the nearest minute)

It will take 27 minutes to fill the tank completely.

3. (a) Volume of water in Tank A at first = 40 × 25 × 41.4
= 41 400 cm^3

(b) Total volume of water in Tanks A and B
= (40 × 25 × 3 units) + (80 × 20 × 1 unit)
= 4600 units
Height of water level in Tank B = 41 400 ÷ 4600
= 9 cm
Height of water level in Tank A = 9 × 3
= 27 cm
Volume of water remaining in Tank A = 40 × 25 × 27
= 27 000 cm^3
= 27 litres

4. (a) 9000 ÷ 3 × 4 = 12 000
12 000 ÷ 25 ÷ 20 = 24

Height of Tank A is 24 cm.

(b) 9000 ÷ 2 = 4500
4500 ÷ 20 = 225
$\sqrt{225}$ = 15

Length of Tank B is 15 cm.

Worksheet 5

1. Volume of big cuboid = 13 × 25 × 13
= 4225 cm^3
Volume of small cuboid = (13 – 8) × (13 – 8) × 25
= 625 cm^3
Volume of remaining solid = 4225 – 625
= 3600 cm^3

2. (a) Length of one cube = $\sqrt{9}$
= 3 cm
Volume of one cube = 3 × 3 × 3
= 27 cm^3

(b) Number of cubes used = 378 ÷ 27
= 14

(c) Figure 4

3. Total volume of water = 1 + 6.08
= 7.08 ℓ
= 7080 cm^3
Capacity of bottom cuboid = 42 × 12 × 10
= 5040 cm^3
Volume of water that will flow into top cuboid
= 7080 – 5040
= 2040 cm^3
Height of top cuboid = 2040 ÷ (12 × 10)
= 17 cm
Water level from base of tank = 10 + 17
= 27 cm

4. (a) Volume of water in Tank A after 12 minutes
= 1200 × 12
= 14 400 cm^3
Height of water in Tank A after 12 minutes
= 14 400 ÷ (32 × 25)
= 18 cm

(b) Height increment of water level in Tank A
= 1200 ÷ (32 × 25)
= 1.5 cm per minute
Height increment of water level in Tank B
= 1800 ÷ (25 × 12)
= 6 cm per minute
18 ÷ (6 – 1.5) = 4
4 min after 11.12 a.m. is 11.16 a.m. or 11 16.

Height of water level in both tanks would be equal at 11.16 a.m. or 11 16.

Problem Solving

1. (a) Volume of perfume = 8 × 4
= 32 cm^3
7 – 5 = 2 cm
Volume of empty space in Figure 2 = 8 × 2
= 16 cm^3
Capacity of bottle in Figure 1 = 32 + 16
= 48 cm^3

(b) 32 ÷ 2 = 16 cm^3
Height of perfume level in Figure 3
= 16 ÷ 6
= 2.67 cm (to 2 decimal places)

2. (a) Difference in height $= \frac{5}{6} - \frac{4}{5}$
$= \frac{25}{30} - \frac{24}{30}$
$= \frac{1}{30}$

Volume of water flowing out of Container P
$= (\frac{1}{30} \times 70 \times 30 \times 50)$
$= 3500 \text{ cm}^3$
$3500 \div 70 = 50 \text{ cm}^3/\text{s}$

Water is flowing out of Container P at 50 cm^3/s.

(b) Volume of water in Container P $= (\frac{5}{6} \times 70 \times 30 \times 50)$
$= 87\,500 \text{ cm}^3$
Base area of Container P $= 70 \times 30$
$= 2100 \text{ cm}^2$
Base area of Container Q $= 30 \times 30$
$= 900 \text{ cm}^2$
$2100 \text{ cm}^2 : 900 \text{ cm}^2 = 7 : 3$

10 units $= 87\,500 \text{ cm}^3$
1 unit $= 87\,500 \div 10$
$= 8750 \text{ cm}^3$
3 units $= 3 \times 8750$
$= 26\,250 \text{ cm}^3$

$26\,250 \div 50 = 525$ seconds
$= 8\frac{3}{4}$ minutes

The tap is turned on for $8\frac{3}{4}$ minutes.

Self-Test

Section A

1. (4) 2. (2) 3. (1) 4. (3) 5. (4)

Section B

6. Breadth of square face $= \sqrt{64}$
$= 8 \text{ m}$
Volume of cuboid $= 80 \times 8$
$= 640 \text{ m}^3$

7. Length of cube $= \sqrt[3]{343}$
$= 7 \text{ cm}$
4 of its faces are unpainted.
Total area of unpainted faces $= 7 \times 7 \times 4$
$= 196 \text{ cm}^2$

8. Capacity of tank $= 40 \times 15 \times 28$
$= 16\,800 \text{ cm}^3$
Volume of water in tank $= \frac{3}{4} \times 16\,800$
$= 12\,600 \text{ cm}^3$
$12\,600 \div 250 = 50.4$
It will take 50.4 minutes to fill $\frac{3}{4}$ of the tank.

9. Volume of water in tank $= 60 \times 30 \times 50$
$= 90\,000 \text{ cm}^3$
$90\,000 \div 900 = 100$
100 mugs are required.

Section C

10. Length of a cut off square $= \sqrt{16}$
$= 4 \text{ cm}$
Length of remaining cardboard $= 42 - 4 - 4$
$= 34 \text{ cm}$
Breadth of remaining cardboard $= 32 - 4 - 4$
$= 24 \text{ cm}$
Height of remaining cardboard $= 4 \text{ cm}$
Volume of box $= 34 \times 24 \times 4$
$= 3264 \text{ cm}^3$

11. (a) Capacity of tank $= 25 \times 18 \times 20$
$= 9000 \text{ cm}^3$
Volume of water in tank $= \frac{4}{9} \times 9000$
$= 4000 \text{ cm}^3$
$= 4$ litres

(b) Capacity of pail $= 20\%$ of 9000
$= 1800 \text{ cm}^3$
Remaining volume of water needed $= 9000 - 4000$
$= 5000 \text{ cm}^3$
$5000 \div 1800 = 2\frac{7}{9}$
Minimum number of pails needed is 3.

Challenge

Volume of Cuboid A $= 6 \times 6 \times 26$
$= 936 \text{ cm}^3$

Volume of Cuboid B $= 7 \times 7 \times 21$
$= 1029 \text{ cm}^3$

Volume of Cuboid C $= 9 \times 10 \times 12$
$= 1080 \text{ cm}^3$

Cuboids B and C can fulfill the requirement to fill one litre of fruit juice as their volumes are more than 1000 cm^3.
(1 litre = 1000 cm^3)

Cuboid B can fulfill the requirement of taking up less space during easy stacking and packing.

So, I would choose Cuboid B.

9 Pie Charts

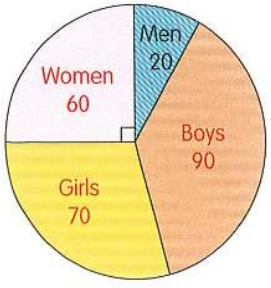
Part 1: Presenting Data in Pie Charts

Worksheet 1

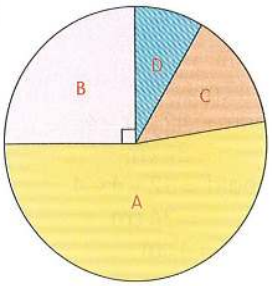
1. (a)

Types of people	Men	Women	Boys	Girls	Total
Number of people	20	60	90	70	240

(b)



2. (a)



(b) $\frac{1}{4} \times 200 = 50$

Part 2: Reading and Interpreting Data in Pie Charts

Worksheet 2

1. (a) 100% – 30% – 20% – 10% = 40%

(b) $\frac{40}{100} \times \$50\,000 = \$20\,000$

(c) $\frac{30}{10} = 3$

(d) 20% : 30% = 2 : 3

2. (a) 300

(b) 300 × 4 = 1200
$\frac{480}{1200} = \frac{2}{5}$

(c) 1200 – 480 – 300 – 300 = 120
$\frac{120}{1200} \times 100\% = 10\%$

(d) 300 : 1200 = 1 : 4

3. (a) 100% – 40% – 30% – 20% = 10%

(b) $\frac{20}{100} = \frac{1}{5}$

(c) 20% × 2 = 40%
Comics

(d) 40% → 800
1% → 800 ÷ 40 = 20
100% → 20 × 100 = 2000

(e) 10% : 30% = 1 : 3

(f) $\frac{10}{100} \times 2000 = 200$

4. (a) $\frac{15}{100} = \frac{3}{20}$

(b) 100% – 25% – 20% – 15% = 40%
25% : 40% = 5 : 8

(c) 15% → 75
1% → 75 ÷ 15 = 5
100% → 5 × 100 = 500

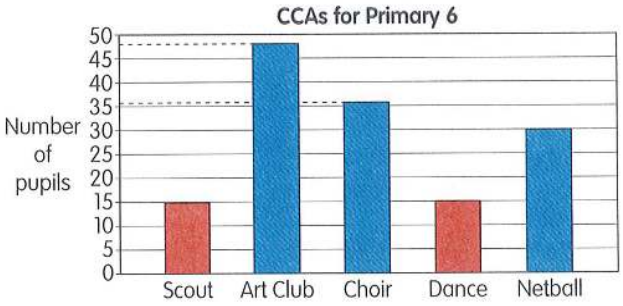
5. (a) $\frac{1}{5} = 20\%$
100% – 25% – 25% – 20% = 30%

(b) 30% – 20% = 10%
10% → \$570
1% → \$570 ÷ 10 = \$57
100% → \$57 × 100 = \$5700

(c) 25% + 25% = 50%
$\frac{50}{100} \times \$5700 = \$2850$

6. (a) $\frac{1}{4}$ of Primary 6 pupils → 36
$\frac{4}{4}$ of Primary 6 pupils → 36 × 4 = 144
$\frac{30}{144} = \frac{5}{24}$

(b) 144 – 48 – 36 – 30 = 30
30 ÷ 2 = 15



Worksheet 3

1. (a) 1760 ÷ 4 = 440

(b) 100% – 25% – 20% – 12.5% = 42.5%
42.5% of 1760 = 748
748 – 510 = 238

2. (a) \$6000 ÷ 4 = \$1500

(b) **Method 1**

$\frac{25}{100} \times \$6000 = \$1500$

$\frac{20}{100} \times \$6000 = \$1200$

Ben and Calvin's week salary before increase
= \$6000 – \$1500 – \$1200 – \$1000
= \$2300

$\frac{10}{100} \times \$2300 = \$230$

\$2300 + \$230 = \$2530

Method 2

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

$\frac{3}{4} \times \$6000 = \$4500$

$\frac{20}{100} \times \$6000 = \$1200$

Ben and Calvin's week salary before increase
= \$4500 – \$1000 – \$1200
= \$2300

100% of their savings → \$2300
1% of their savings → \$2300 ÷ 10 = \$23
110% of their savings → \$23 × 110 = \$2530

Method 3

$\frac{1000}{6000} = \frac{1}{6}$

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

$1 - \frac{1}{4} - \frac{1}{5} - \frac{1}{6} = \frac{60}{60} - \frac{15}{60} - \frac{12}{60} - \frac{10}{60}$

$= \frac{23}{60}$

$\frac{23}{60} \times \$6000 = \$2300$

$110\% \times \$2300 = \$2530$

3. Yellow and Blue = 25% + 10%
   = 35%

   Red and Purple = 100% – 35%
   = 65%

   65% → 130
   1% → 130 ÷ 65 = 2
   25% → 2 × 25 = 50

4. 60% of 240 = 144

   100% – 60% – 25% – 5% = 10%
   10% of 240 = 24
   144 – 24 = 120

Problem Solving

1. (a) $1 - \frac{1}{12} - \frac{1}{3} - \frac{1}{4} = \frac{12}{12} - \frac{1}{12} - \frac{4}{12} - \frac{3}{12}$

   $= \frac{4}{12}$

   $= \frac{1}{3}$

   $\frac{1}{3} \div 2 = \frac{1}{3} \times \frac{1}{2}$ or $\frac{4}{12} \div 2 = \frac{4}{12} \times \frac{1}{2}$

   $= \frac{1}{6}$ $= \frac{1}{6}$

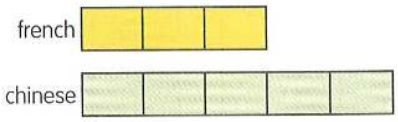
   (b) $\frac{1}{4}$ of Primary 6 pupils → 48

   $\frac{4}{4}$ of Primary 6 pupils → 48 × 4 = 192

   $\frac{1}{3}$ of Primary 6 pupils → $\frac{1}{3} \times 192 = 64$

2. (a) 288 ÷ 4 = 72

   (b) 72 × 3 = 216
   216 – 64 = 152

   8 units = 152
   1 unit = 152 ÷ 8
   = 19
   5 units = 19 × 5
   = 95

   (c) 64 : 72 = 8 : 9

Self-Test

Section A

1. (1) 2. (3) 3. (2) 4. (3) 5. (3)

Section B

6. 100% – 50% – 20% – 20% = 10%

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

7. 100% – 25% – 15% – 10% – 10% = 40%

   25% of the adults → 180
   1% of the adults → 180 ÷ 25 = 7.2
   40% of the adults → 40 × 7.2 = 288

8. **Method 1**
   2 units = 38
   1 unit = 38 ÷ 2
   = 19
   12 units = 19 × 12
   = 228

   Method 2
   2 units = 38
   6 units = 38 × 3
   = 114
   114 × 2 = 228

   Method 3
   2 units = 38
   1 unit = 38 ÷ 2
   = 19
   3 units = 19 × 3
   = 57
   57 × 4 = 228

9. **Method 1**
   \$27 + \$27 = \$54
   \$54 – \$18 – \$27 = \$9

   Method 2
   $\frac{1}{4}$ → \$27
   $\frac{4}{4}$ → \$27 × 4 = \$108
   \$108 – \$27 – \$27 – \$27 – \$18 = \$9

Section C

10. $\frac{1}{4}$ of the number of Primary 6 pupils → 35 + 20 = 55

    $\frac{2}{4}$ of the number of Primary 6 pupils → 55 × 2 = 110

    Number of Primary 6 pupils who read 3 books = 110 – 60
    = 50

    Number of Primary 6 pupils who read at least 3 books
    = 50 + 35
    = 85

11. (a) $\frac{1}{2} - \frac{1}{4} - \frac{1}{6} = \frac{6}{12} - \frac{3}{12} - \frac{2}{12}$

$= \frac{1}{12}$

$\frac{1}{12} \times 100\% = 8.33\%$ (to 2 decimal places)

(b) $\frac{1}{6}$ of her monthly salary $\rightarrow$ \$240

$\frac{6}{6}$ of her monthly salary $\rightarrow$ \$240 × 6 = \$1440

$\frac{1}{12} \times \$1440 = \$120$ (shopping)

$\frac{5}{12} \times \$1440 = \$600$ (savings)

$\frac{1}{4} \times \$1440 = \$360$ (food)

\$120 : \$600 : \$360 = 1 : 5 : 3

Challenge

incorrect

incorrect because the proportion of pupils who solve the problem correctly and the proportion of pupils who did not attempt are equal.

incorrect

incorrect because it shows the proportion of pupils who did not attempt is more than half.

correct

correct because it shows the correct proportion of pupils who solve the challenging mathematical problem.

10 Solid Figures

Part 1: Cones, Cylinders, Prisms and Pyramids

Worksheet 1

1. (a) Cube
   (b) Cone
   (c) Pyramid
   (d) Cuboid
   (e) Cylinder
   (f) Prism

2. (a) 6 faces
   12 edges
   8 vertices

   (b) 5 faces
   8 edges
   5 vertices

   (c) 4 faces
   6 edges
   4 vertices

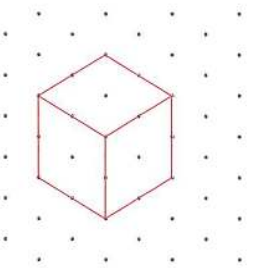
   (d) 6 faces
   12 edges
   8 vertices

   (e) 5 faces
   9 edges
   6 vertices

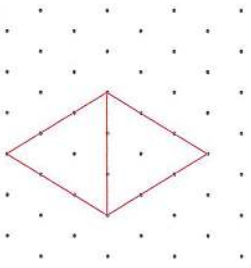
Part 2: Drawing Solid Figures on Isometric Grids

Worksheet 2

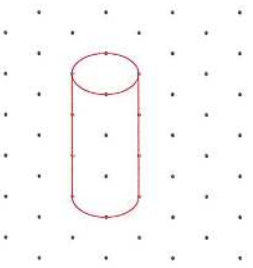
(a)



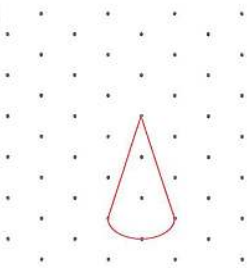
(b)



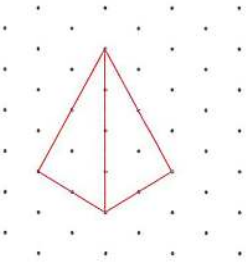
(c)



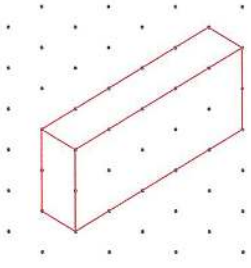
(d)



(e)



(f)



Part 3: Nets of Solids

Worksheet 3

1. Pyramid

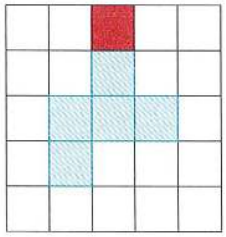
2. Tick the box under the cube

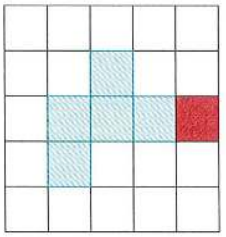
3. Circle Figures A and B

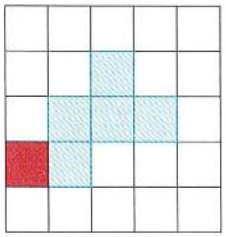
Worksheet 4

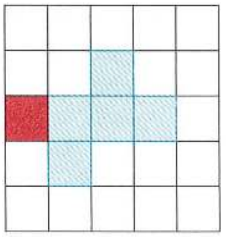
1. Circle Figures C, K and L

2 (a) Accept any possible answer

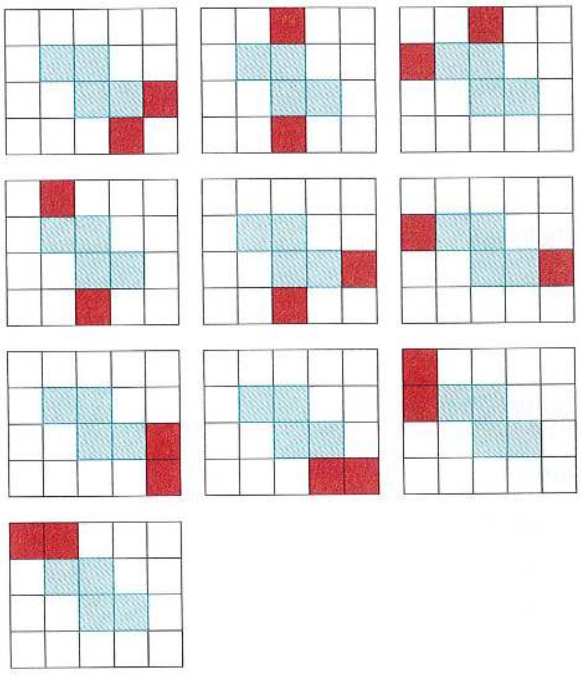






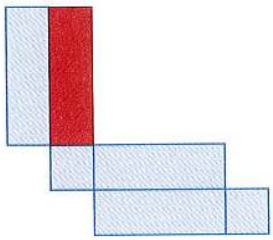


(b) Accept any possible answer



Worksheet 5

1. Circle Figure A

2. 

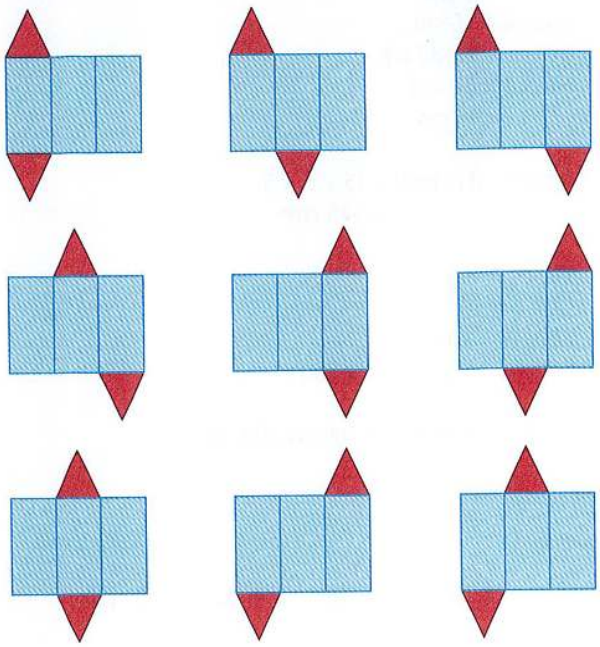
3. Circle Figure C

Worksheet 6

1. Tick the box under (a)
2. Tick the box under (b)
3. Tick the box under (d)
4. Tick the box under (c)

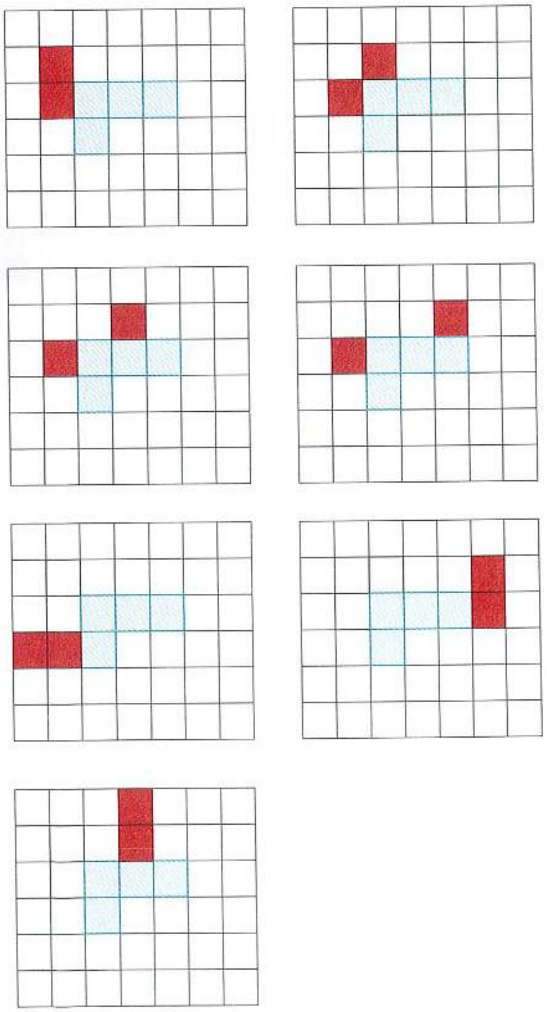
Worksheet 7

1. (a) Accept any 6 possible answers



(b) 5 faces

2. Accept any 2 possible answers



Problem Solving

1. Length = 15 ÷ 3
   = 5 cm
   Breadth = 5 cm
   40 – 5 – 5 = 30 cm
   Height = 30 ÷ 2
   = 15 cm

   Volume of cuboid = 15 × 5 × 5
   = 375 cm^3

2. 20 × 5 = 100
   12 × 5 = 60
   20 × 12 = 240
   (100 + 60 + 240) × 2 = 800

   Total surface area of solid is 800 cm^2.

Self-Test

Section A

1. (2) 2. (4) 3. (1) 4. (2) 5. (2)

Section B

6. Cuboid

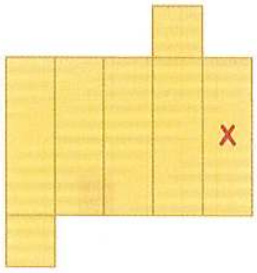
7. Pyramid

8. Cube

9. Accept any possible answer

10. Triangles and rectangles

11.



Section C

12. (a) 5 × 8 = 40
    120 – 40 = 80
    Total length of AB and XY = 80 ÷ 2
    = 40 cm

    (b) 8 units = 40 cm
    1 unit = 40 ÷ 8
    = 5 cm
    5 units = 5 × 5
    = 25 cm
    3 units = 3 × 5
    = 15 cm
    Volume of cuboid = 25 × 15 × 5
    = 1875 cm^3

13. (a) Cuboid or Rectangular prism

    (b) Length of square base = 18 ÷ 3
    = 6 cm

    (c) Length of rectangular base = (48 – 12) ÷ 2
    = 18 cm
    Volume of solid = 6 × 6 × 18
    = 648 cm^3

Challenge

Circle Figure C
Figure C is not the net because it has an extra triangular face.

Final-Year Review

Paper 1

Section A

1. (4) 2. (3) 3. (1) 4. (3) 5. (3)
6. (4) 7. (1) 8. (3) 9. (2) 10. (3)
11. (4) 12. (1) 13. (4) 14. (2) 15. (3)

Section B

16. $5\frac{1}{4} \div \frac{1}{8} = \frac{21}{4} \times 8$
= 42

17. $3\frac{3}{4}$ h

18. 4 × 4 + 7 × 2 + 14 = 16 + 14 + 14
= 44 m

19. 2

20. 54 × 3 = 162
162 – 35 – 67 = 60

21. $\frac{6}{12}$ of the marbles are red.
$\frac{6}{12} - \frac{5}{12} = \frac{1}{12}$
$\frac{1}{12} \rightarrow 150$
$\frac{12}{12} \rightarrow 12 \times 150 = 1800$

22. **Method 1**
Volume of water in tank = 20 × 10 × 9
= 1800 cm^3

Volume of water when the tank is $\frac{2}{3}$ full = $\frac{2}{3} \times 20 \times 10 \times 15$
= 2000 cm^3

Increase in volume of water = 2000 – 1800
= 200 cm^3

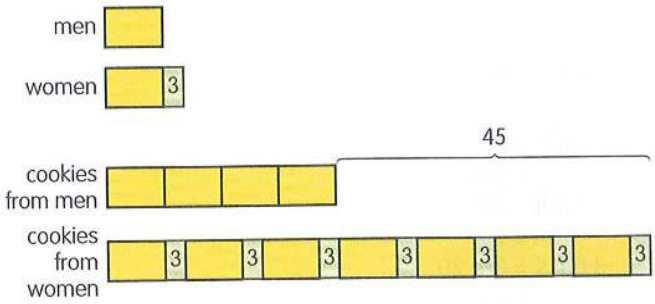
Increase in height of water level = $\frac{200}{(20 \times 10)}$
= 1 cm

Method 2
Height of water when the tank is $\frac{2}{3}$ full = $\frac{2}{3} \times 15$
= 10 cm

Increase in height of water level = 10 – 9
= 1 cm

23. The least possible mass of the parcel is 2.5 kg.
First 2 kg → \$6
Next 0.5 kg → \$0.10 × 5 = \$0.50
Total → \$6 + \$0.50 = \$6.50

24. **Method 1**



7 units + (3 × 7) – 4 units = 45
3 units + 21 = 45
3 units = 45 – 21
= 24
1 unit = 24 ÷ 3
= 8
8 men baked the cookies.

Method 2
Let the number of men be x.
Then the number of women is $(x + 3)$.
The number of cookies baked by the men is $4x$.
The number of cookies baked by the women is $7(x + 3)$.

$7(x + 3) - 4x = 45$
$7x + 21 - 4x = 45$
$3x = 45 - 21$
$= 24$
$x = 24 \div 3$
$= 8$
8 men baked the cookies.

25. 100% – 20% = 80% (boys and girls)
$\frac{25}{100} \times 80\% = 20\%$ (boys)
100% – 20% – 20% = 60% (girls)
60% → 480
20% → 480 ÷ 3 = 160

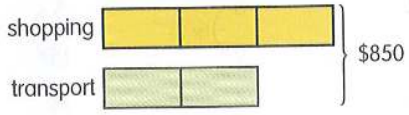
26. 30 + 32 + 16 + 22 = 100
$\frac{30}{100} = \frac{3}{10}$

27. $\angle CBA = 32°$
$\angle ACB = 180° - 32° - 90°$
$= 58°$
$\angle BCH = 180° - 58°$
$= 122°$

28. 8 + 4 = 12 (eldest girl received)
140 – 12 = 128 (rest of the girls received)
128 ÷ 8 = 16 (number of girls who received 8 beads)
16 + 1 = 17

29. One packet of popcorn cost $\$(w + 3)$.
Two cans of tea cost $\$2w$.
Two packets of popcorn cost $\$(w + 3) + \$(w + 3)$.
$\$2w + \$(w + 3) + \$(w + 3) = \$(4w + 6)$

30. $\frac{1}{4} \times \$1800 = \$450$ (on meals)
\$1800 – \$450 – \$500 = \$850 (on shopping and transport)



5 units = \$850
1 unit = \$850 ÷ 5
= \$170
2 units = \$170 × 2
= \$340 (on transport)

Paper 2

Section A

1. (a) West (b) Library

2. Number of smallest triangles = 2 × 4 × 4
= 32
Area of figure = 6 × 32
= 192 cm²

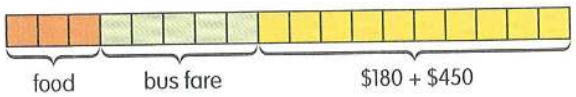
3. 40, 44, 48 and 52 are the multiples of 4 that are between 36 and 55. Out of the above multiples of 4, only the sum of 44 and 1 is a multiple of 3.
Paul is 44 years old now.

4. 1 child → \$$m$
3 children → \$$3m$
wife → \$$3m$

$\$3m + \$3m + \$(m + 525) = \$4900$
$\$3m + \$3m + \$m = \$4900 - \$525$
$\$7m = \$4375$
$\$m = \$4375 \div 7$
$= \$625$

Value of m is 625.

5.



10 units = \$180 + \$450
= \$630
1 unit = \$630 ÷ 10
= \$63
5 units = \$63 × 5
= \$315
John spent \$315 on bus fare.

OR

$\frac{2}{3}$ of reminder → \$180 + \$450 = \$630
$\frac{1}{3}$ of reminder → \$630 ÷ 2 = \$315
John spent \$315 on bus fare.

Section B

6.

	Karen	:	Amiya	:	Total
Before	2 (×3) → 6	:	3 (×3) → 9	:	5 (×3) → **15**
After	11	:	4	:	**15**

9 units – 4 units = 5 units or 11 units – 6 units = 5 units

5 units = \$30
1 unit = \$30 ÷ 5
= \$6
4 units = 4 × \$6
= \$24

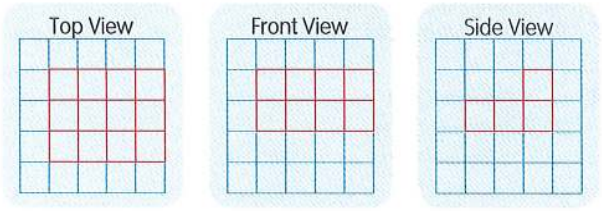
Amiya had \$24 in the end.

7. (a) 4 faces were unpainted after the 3 cubes were separated apart.

(b) 4 faces ⟶ 324 cm²
1 face ⟶ 324 ÷ 4 = 81 cm²
1 edge ⟶ $\sqrt{81}$ = 9 cm

Volume of 1 cube = 9 × 9 × 9
= 729 cm³

8.



9. (a) Number of girls in the school = $\frac{40}{100}$ × 200
= 80

Number of boys in the school = 200 – 80
= 120

Number of boys who passed the quiz = $\frac{60}{100}$ × 120
= 72

(b) Number of girls who passed the quiz = $\frac{80}{100}$ × 80
= 64

Total number of pupils who passed the quiz = 64 + 72
= 136

Percentage of pupils who passed the quiz = $\frac{136}{200}$ × 100%
= 68%

10. (a) Number of lollipops in a set = 7 + 3
= 10

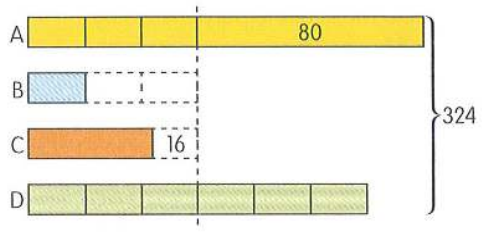
Number of sets = 160 ÷ 10
= 16

Least number of lollipops Meiling buys = 7 × 16
= 112

(b) 50¢ × 112 = 5600¢
= \$56

Meiling needs to pay \$56.

11.



4 × 81 = 324

13 units = 324 – 80 + 16
= 260
1 unit = 260 ÷ 13
= 20
3 units = 3 × 20
= 60
Value of A = 60 + 80
= 140

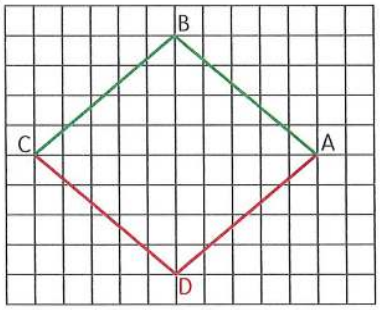
12. (a) 5 units = 35 cm
1 unit = 35 ÷ 5
= 7 cm

Length = 3 units
= 3 × 7
= 21 cm

(b) Height = 1 unit
= 1 × 7
= 7 cm

Volume of cuboid = 21 × 21 × 7
= 3087 cm³

13. (a)



(b) 78°

14. (a) Volume of water after 15 minutes = 15 × 500
= 7500 cm³

(b) Difference in rate = 500 – 400
= 100 cm³/minute

Amount of water left to be filled = 20 000 – 7500
= 12 500 cm³

Time taken to fill in remaining water = 12 500 ÷ 100
= 125 min

Total time taken = 15 + 125
= 140 min

15. (a) $25 \times 2 = 50$
$70 + 50 = 120$
$120 \div 3 = 40$
$40 + 25 + 0 = 65$
There were 65 questions in the quiz.

(b) $13 \times 2 = 26$
$103 + 26 = 129$
$129 \div 3 = 43$
$65 - 43 - 13 = 9$
Ling did not answer 9 questions.

16. (a) $\angle ABD = 180° - 75° - 65°$
$= 40°$

(b) $\angle ABF = 90° - 60°$
$= 30°$
$\angle FBG = 40° - 30°$
$= 10°$

(c) $\angle CDE = 180° - 65°$
$= 115°$
$\angle GCD = 90° - 60°$
$= 30°$
$\angle DEC = 180° - 115° - 30°$
$= 35°$

17. (a) Radius of biggest circle $= 4 \times 2 \times 2$
$= 16$ cm

Area of biggest circle $= \frac{22}{7} \times 16 \times 16$
$= \frac{5632}{7}$ cm^2

Area of smallest circle $= \frac{22}{7} \times 4 \times 4$
$= \frac{352}{7}$ cm^2

Area of biggest circle : Area of smallest circle
$= \frac{5632}{7} : \frac{352}{7}$
$= 16 : 1$

(b) Area of medium-sized circle $= \frac{22}{7} \times 8 \times 8$
$= \frac{1408}{7}$ cm^2

Area of shaded figure $= \frac{5632}{7} - \frac{1408}{7}$
$= \frac{4224}{7}$ cm^2
$= 603\frac{3}{7}$ cm^2

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ISBN 978-981-4658-78-2

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