

Excel

YEARS
6
to
7

Non- Calculator Workbook

Free-to-download sample pages with answers

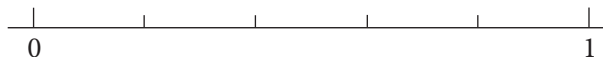
ESSENTIAL
Skills

Get the Results You Want!

1 Mixed Decimals

- 1 Mark the position of the given decimal on the number line provided:

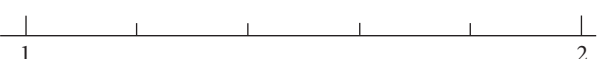
a 0.8



b 3.25



c 1.65



- 2 Which is larger: 0.2 or 0.17?

- 3 The population of Australia is about 23.65 million. Write that number in numerals (using digits only, not words).

- 4 Arrange in order from lowest to highest:

0.6 0.508 0.56 0.079

- 5 Find:

a $0.6 + 0.3$

b $0.8 - 0.2$

c 0.7×3

d 9×1.2

e $0.8 \div 4$

f $1.2 + 2.34$

g $6.4 - 3.87$

h 123.45×2

i $5.67 \div 9$

j $59.6 \div 8$

- 6 Lily needs to add 19.7, 24.65, 85.192 and 30.48. She says that the answer must be around 160. Is Lily correct? Justify your answer.

- 7 Find:

a $7.3 + 10$

b 7.3×10

c $7.3 \div 10$

d 524.7×100

e $651.9 \div 100$

f 0.008×100

g $0.5 \div 1000$

h 64.3×1000

- 8 Find:

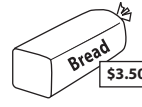
a $2 \times (0.8 + 0.6)$

b $(3 \times 0.9) - (5 \times 0.4)$

c $24.04 \div 4 + 3.7$

- 9 Tom buys five cans of dog food, two loaves of bread and three cartons of juice with prices as shown.

Find the cost of the:



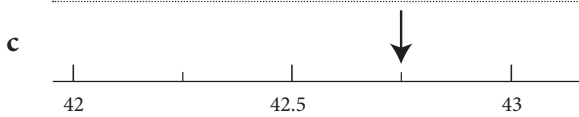
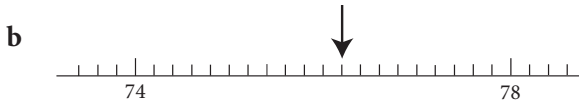
a dog food

b bread

c juice

d total purchases

- 1 What number (expressed as a decimal) is at the position indicated on the number line?



- 2 Arrange in ascending order:

0.32, 0.2, 0.08, 0.175

- 3 Find:

a $37.2 + 19.46$

b $16.8 - 9.37$

- 4 If $67 \times 43 = 2881$ write down the value of:

a 6.7×4.3

b 0.043×0.67

c 0.067×4300

- 5 Find:

a 2.345×600

b $25.3 \div 2.3$

- 6 Find:

a $0.97 \times 6.8 + 0.03 \times 6.8$

b $87.24 \times 12.7 - 2.7 \times 87.24$

c $5 \times 7.65 \times 2$

d $4 \times 133.8 \times 25$

e $6.28 \times 7.49 \times 3.62 \times 0 \times 1.83$

- 7 Find the average of 3.24, 1.93, 0.78 and 0.06.

- 8 A truck carries 6.8 cubic metres of mulch in a full load. How many full loads will be needed to get at least 30 cubic metres of mulch?

- 9 Gavin used a calculator to find that

$813 \div 32 = 25.40625$

Later he realised that the question should have been $81.3 \div 0.32$. What is the answer to Gavin's question?

- 10 If the population of the United States is 321.3 million and the population of New Zealand is 4.5 million, how many times greater is the population of the USA than that of New Zealand?

2 Rounding Off

If the next digit after the required number of places is 5 or higher, round up.

1 Round to the nearest hundred:

- a 576
- b 1224
- c 203 861

2 Round to the nearest whole number:

- a 517.8
- b 11.275
- c 6.49

3 Round to the nearest five cents:

- a \$2.78
- b \$184.56
- c \$49.03
- d \$0.32

4 Write correct to one decimal place:

- a 0.68
- b 0.475
- c 11.238
- d 5.15
- e 157.98

5 Write correct to two decimal places:

- a 9.124
- b 13.5618
- c 2.1475
- d 6.485
- e 142.673

6 Write correct to three decimal places:

- a 0.9468
- b 15.6255
- c 0.4876
- d 123.5019
- e 67.389999

7 Find 2×3.7845 , giving the answer correct to two decimal places.

.....

8 a Find the sum of 17.2358, 9.41625 and 235.157 and give the answer to two decimal places.

.....

b Round off to two decimal places each of the numbers 17.2358, 9.416 25 and 235.157 and then find the sum.

.....

c Are the answers to parts **a** and **b** the same? If not, which is the more accurate answer?

.....

9 Six friends equally share the cost of hiring a car for \$265.

a To the nearest cent, how much will each pay?

.....

b If they rounded the amount that each pays up to the nearest \$10, how much money would they have for petrol?

.....

.....

1 Find:

a 10% of \$800

b 5% of \$800

c 15% of \$800

2 Find:

a 50% of \$90

b 25% of \$90

c 75% of \$90

3 Find:

a 10% of \$3000

b 20% of \$3000

c 70% of \$3000

4 Find:

a 20% of \$60

b 50% of \$128

c 25% of \$20

d 30% of \$4000

e 50% of \$9

f 10% of \$17

g 5% of \$300

h 40% of \$1200

i 15% of \$50

5 Tony received a 30% discount when he bought a fridge for \$840.

a How much was the discount?

b How much did Tony pay for the fridge?

6 A store is having a sale and advertises 20% off the marked price of all goods.

a How much would you save on jeans priced at \$90?

b How much would you pay for a jacket priced at \$210?

7 Renae receives a 100% discount on a book priced at \$34.95. How much does she pay?

8 Two shops sell identical pairs of shoes. At one shop the shoes are priced at \$120 but there is a discount of 15%. At the other shop the marked price is \$150 but there is a 30% discount. Which shop has the cheapest shoes and by how much?

1 Find:

a 10% of 40

b 50% of 60

c 25% of 80

2 Find:

a 75% of 44

b 20% of 30

c 5% of 300

d 15% of 20

e 70% of 70

f 90% of \$60 000

g 35% of \$2000

h 7% of \$8

3 What percentage is:

a 30 out of 40?

b 56 out of 80?

c 36 out of 45?

d 40 out of 200?

e 8 out of 160?

f 72 cm of 1 m?

g 825 g of 1 kg?

h 42 minutes of 1 hour?

4 A company owns 140 cars and 60 trucks. 20% of the cars and 10% of the trucks are on the road. What percentage of the company's vehicles are on the road?

5 Max paid \$60 for a shirt priced at \$80.

a How much was the discount?

b What was the percentage discount?

c How much would Max pay for pants priced at \$120 if he received the same percentage discount?

6 60% of the 120 students studying a course went on an excursion. 75% of the students on the excursion were female. How many female students went on the excursion?

Comparing Fractions, Decimals and Percentages

1 Write as decimals:

a $\frac{7}{10}$

b $\frac{23}{100}$

c $\frac{9}{100}$

d $\frac{1}{2}$

e $\frac{1}{4}$

2 Write as fractions in simplest form:

a 0.9

b 0.14

c 0.05

d 0.75

e 0.8

3 Write as percentages:

a $\frac{27}{100}$

b $\frac{1}{2}$

c $\frac{9}{10}$

d $\frac{7}{20}$

e 0.45

f 3.68

g 7.5

h 0.05

4 Write as decimals:

a 56%

b 3%

c 125%

d 80%

5 Write as fractions in simplest form:

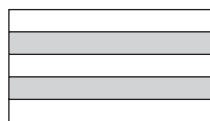
a 87%

b 150%

c 75%

d 10%

6 What percentage is shaded?



7 Which is greater?

a $82\frac{1}{2}\%$ or $\frac{17}{20}$

b 0.6 or $\frac{3}{5}$

c 2.7 or 275%

8 a Jim pays \$0.17 in every dollar in tax. What percentage of Jim's earnings are paid in tax?

.....

b Jamie is taxed at 20%. What fraction of Jamie's earnings are paid in tax?

.....

9 Concert tickets are either red, blue or green. 48% of the tickets are red and 27% are blue. What **fraction** of the tickets is green?

.....

10 Ted needs 0.04 L of oil in every litre of fuel for his chainsaw. What percentage of the fuel is oil?

.....

Conversions between Fractions, Decimals and Percentages

1 Change to percentages:

- a 0.83
- b 0.9
- c 0.07
- d 2.5
- e 0.125

2 Change to fractions in simplest form:

- a 0.8
- b 0.35
- c 1.04
- d 0.375
- e 53%
- f 60%
- g 4%
- h 250%
- i 12.5%

3 Change to decimals:

- a 72%
- b 30%
- c 1%
- d 3.7%
- e 140%

4 Change to percentages:

- a $\frac{2}{5}$
- b $\frac{17}{20}$

c $\frac{123}{500}$

d $1\frac{3}{4}$

e $\frac{7}{8}$

5 Change to decimals:

a $\frac{5}{8}$

b $\frac{1}{3}$

c $\frac{4}{9}$

d $\frac{5}{12}$

e $\frac{3}{7}$

6 Which is the largest: 1.2, $1\frac{1}{5}$ or 120%?

7 Each ticket in a raffle has a one-in-ten-thousand chance of winning. What is this as a percentage?

8 In Redland five out of seven politicians are male and in Westland males make up 73% of politicians. Which place has the higher level of female politicians?

- 1 A bag holds one red, two white and three blue pegs. What is the ratio of:

a blue to white pegs?

b white to red pegs?

c red to blue pegs?

d blue to red pegs?

e white to blue pegs?

f red to white pegs?

- 2 Simplify:

a $8 : 6$

b $9 : 3$

c $2 : 20$

d $36 : 30$

e $24 : 27$

f $1 : \frac{1}{2}$

g $\frac{5}{8} : \frac{3}{8}$

h $2\frac{3}{4} : 1\frac{1}{4}$

i $\frac{2}{3} : \frac{1}{5}$

j $3.2 : 1.7$

k $1.6 : 2.8$

l $0.7 : 1$

m $3 : 0.6$

- 3 Write as a ratio in simplest form:

a 15 minutes to 1 hour

b 1 m to 1 cm

- 4 The ratio of boys to girls in a class is $3 : 4$. What fraction of the class is boys?

- 5 The ratio of used to new cars for sale at a car yard was $5 : 3$. There were 60 used cars for sale. How many new cars were for sale?

- 6 The ratio of cats to dogs at a shelter was $12 : 7$. There were 42 dogs at the shelter.

a How many cats were at the shelter?

b Another 18 cats and 8 dogs were brought to the shelter. What is the new ratio of cats to dogs?

- 7 Divide \$20 000 in the ratio $3 : 2$

- 8 The ratio of red to green apples in a crate is $4 : 7$. If there are 132 apples in the crate, how many are green?

1 Find the price for one item if you can buy:

a 5 for \$107.50

b 3 for \$22.35

c 7 for \$10.92

d 15 for \$18.00

2 Which is the better buy: 2 kg for \$3.24 or 5 kg for \$7.95?

3 What is the price per litre if 2.5 L costs \$3.50?

4 What is the price per kilogram if you can buy 500 g for \$2.65?

5 Determine the best buy:

5 L for \$9.25, 3 L for \$5.40 or 2 L for \$3.80.

6 Determine the best buy:

8 kg for \$11.60, 12 kg for \$17.40 or 20 kg for \$29.00.

7 Determine the best buy:

500 mL for \$6.45, 2 L for \$25.50 or 2.5 L for \$32.35.

8 Tracy can buy bread rolls for 80 cents each. Alternatively she can buy four rolls for \$2.80 or six rolls for \$4.50. What is the cheapest amount Tracy can pay for a dozen rolls?

9 Maggie needs 9 kg of seed. She can buy 1 kg for \$3.50, 3 kg for \$10.00 or 5 kg for \$16.00. What is the cheapest amount Maggie can pay for 9 kg?

1 Patterns

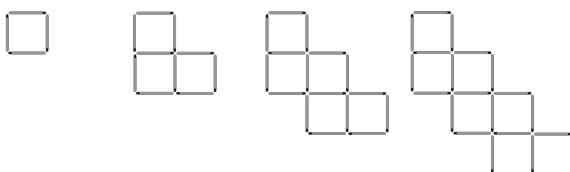
1 Write down the next number in each pattern.

- a 15, 19, 23, 27, _____
- b 100, 93, 86, 79, 72, _____
- c 2, 6, 18, 54, 162, _____
- d 3.1, 3.8, 4.5, 5.2, _____
- e $\frac{1}{8}, \frac{1}{4}, \frac{3}{8}, \frac{1}{2}, \frac{5}{8},$ _____
- f $\frac{1}{16}, \frac{1}{8}, \frac{1}{4}, \frac{1}{2},$ _____

2 Find the missing number in these patterns.

- a 156, 162, _____, 174, 180
- b 8.6, 7.8, 7, _____, 5.4
- c $\frac{1}{10}, \frac{1}{5},$ _____, $\frac{2}{5}, \frac{1}{2}, \frac{3}{5}$
- d 30, _____, 7.5, 3.25, 1.625

3 This pattern was made with matchsticks.

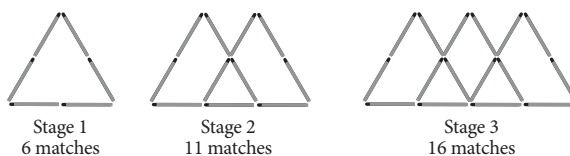


Stage 1	Stage 2	Stage 3	Stage 4
1 square	3 squares	5 squares	7 squares
4 matchsticks	10 matchsticks	16 matchsticks	22 matchsticks

- a How many squares will there be in Stage 5?
- b How many matches will be used in Stage 5?
- c How many squares will there be in Stage 6?
- d How many matchsticks will be used in Stage 6?
- e Write a rule for the number of squares at each stage.

f Write a rule for the number of matchsticks used at each stage.

4 This pattern is made with matches.



- a How many matches will be used at Stage 4?
- b How many matches will be used at stage 5?
- c Write a rule in words for the number of matches used at each stage.

d How many matches will be used at Stage 100?

e At what stage will 101 matches be used?

5 a Write a rule for the values in the table below.

	1	2	4	5	8	
	5	8	14	17		32

b Fill in the missing numbers in the table.

1 Simplify these expressions:

- a $x + x$
- b $2 \times a$
- c $3p + 5p$
- d $4 \times 3d$
- e $9k - 5k$
- f $n \times 7$
- g $3y - y$
- h $7t \times 2$
- i $6z - 5z$
- j $8b \div 4$
- k $g \times g$
- l $p \times q$
- m $2a \times 3b$
- n $\frac{15a}{5}$
- o $\frac{6h}{12}$
- p $\frac{8m}{12}$

2 If $a = 4$, find the value of:

- a $a + 5$
- b $3a$
- c $2a - 1$
- d $\frac{a}{2}$
- e a^2
- f $12 - a$

3 If $x = 3$ and $y = 5$, find the value of:

- a $2x + 7y$
- b $4xy$
- c $x - y$
- d $2(x + y)$

4 If $p = -2$ and $q = 1$, find the value of:

- a $p + q$
- b $p - q$
- c $3q - p$
- d $p - 5q$

5 Simplify, where possible:

- a $2x + 3x + 4y$
- b $5p + 2q + 3p$
- c $6t - 3u$
- d $4m + 2 + 3m$
- e $9 - 7n + 5$
- f $5x^2 + 2x^2$
- g $7m + 5m - 6n + m$
- h $9y - 2y + 4z - 3z$
- i $12p - 3q + 2q - 4q$
- j $7x + 2x - 4y - 5y$

6 Write an expression for the:

- a number 3 more than a
- b number 6 less than p
- c number of cents in x dollars
- d sum of x and y

1 Fill in the gaps to make correct number sentences:

a $5 + \underline{\hspace{2cm}} = 11$

b $12 - \underline{\hspace{2cm}} = 4$

c $\underline{\hspace{2cm}} \times 3 = 18$

d $\underline{\hspace{2cm}} \div 2 = 24$

e $16 \times 2 = 8 \times \underline{\hspace{2cm}}$

f $9 + 7 = \underline{\hspace{2cm}} + 6$

g $\underline{\hspace{2cm}} - 9 = 11$

h $6 + \underline{\hspace{2cm}} = 21 - 6$

2 Mitchell used the rule $\diamond = 5 \times \text{Apple} - 2$ to change each Apple into a $\diamond$. Fill in the missing values.

Apple	1	2	4		13	
$\diamond$	3	8		38		98

3 Together, Mary, Ken and Erin have 42 marbles. Mary has four fewer marbles than Ken and Erin has 10 fewer marbles than Mary. How many marbles does Ken have?

4 Jack starts with a number. He adds 5 and doubles the result. Then Jack subtracts 3 and gets an answer of 15. What number did Jack start with?

5 In total, there are 47 oranges and lemons in a box. There are 19 more oranges than lemons. How many lemons are in the box?

6 ☺ represents the same number in this number sentence: $56 - \text{☺} = 20 + \text{☺}$

What number does ☺ represent?

7 Fill in the missing values in these tables:

a

x	1	2	3	5	9		20
$x + 6$	7					16	

b

x	0	1	4			25
$2x + 1$			9	17	21	

c

x	1	2		5		
$3x - 2$			10		16	25

8 Determine whether it is true or false that the given solution is the solution of the equation:

a $x + 3 = 11$ [$x = 8$]

b $5a - 2 = 13$ [$a = 3$]

c $2p + 7 = 9$ [$p = 8$]

d $13 - 4q = 11$ [$q = \frac{1}{2}$]

9 Solve:

a $x + 8 = 13$

b $a - 9 = 21$

c $7x = 28$

d $\frac{x}{5} = 10$

e $7 - y = 3$

f $15 + z = 14$

10 Solve:

a $3m + 4 = 19$

b $6n - 5 = 37$

c $\frac{2t}{3} = 6$

d $9 - 2p = 1$

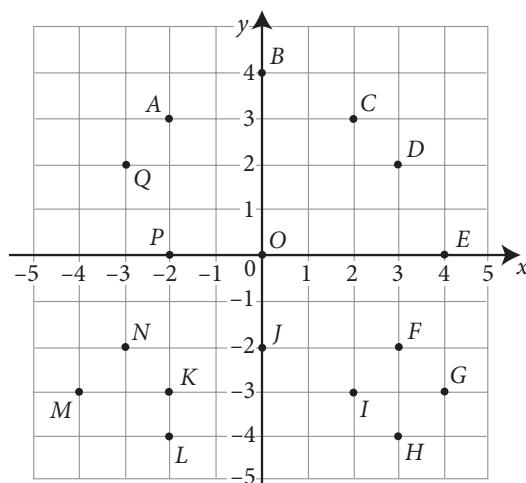
1 Coordinates

1 a What letter is found at:

- (i) $(2, 3)$?
- (ii) $(-2, -3)$?
- (iii) $(0, -2)$?

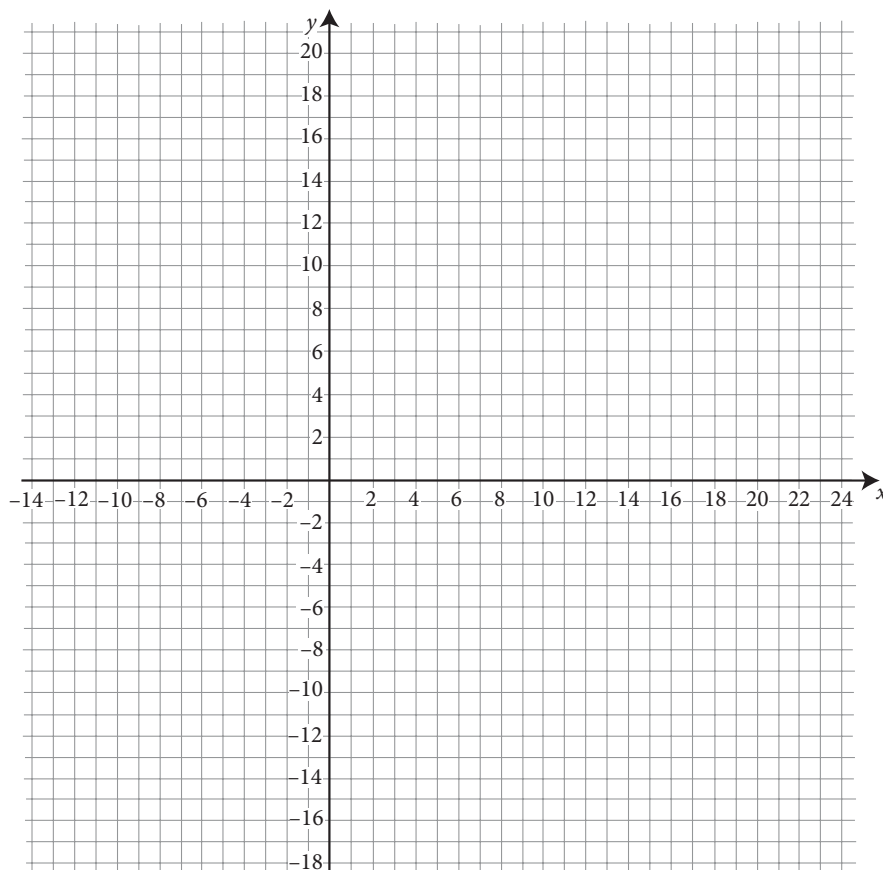
b Write the coordinates of the point marked by the letter:

- (i) A
- (ii) G
- (iii) L



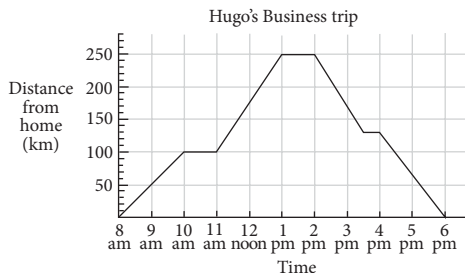
2 On the grid below plot each of the points and join them in the given order.

$(3, -4), (0, 4), (5, 11), (22, 20), (20, 15), (16, 12), (20, 13), (17, 9), (12, 7), (16, 7), (15, 4), (11, 3),$
 $(14, 2), (10, -1), (9, -5), (11, -4), (12, -6), (11, -7), (15, -7), (21, -3), (20, -7), (19, -8), (21, -9),$
 $(23, -12), (16, -11), (10, -15), (5, -17), (2, -17), (-1, -16), (-5, -12), (-8, -6), (-12, -6), (-9, -5),$
 $(-13, -4), (-9, -3), (-8\frac{1}{2}, -1\frac{1}{2}), (-7, 0), (-5\frac{1}{2}, \frac{1}{2}), (-4, 0), (-1, -2), (-4, 5), (-10, 9), (-12, 15), (-8, 12),$
 $(-7, 10), (-7, 11), (-4, 10), (-3, 8), (-2, 9), (2, 7).$ Without joining, place a dot at $(-7, -3).$



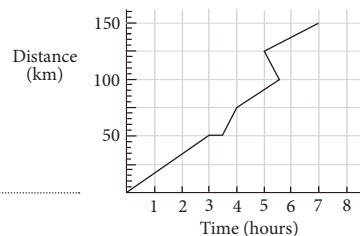
2 Travel Graphs

- 1 Hugo drew this graph of his business trip.

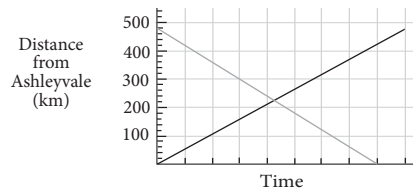


- What time did Hugo leave home?
.....
- For how long was Hugo away from home altogether?
.....
- How far away from home was Hugo at 9 am?
.....
- What does the horizontal section of the graph between 10 am and 11 am indicate?
.....
- For how long was Hugo stopped altogether?
.....
- At what time did he start heading home?
.....
- At about what time(s) was Hugo 200 km from home?
.....
- Was Hugo travelling at a faster average speed between 8 am and 10 am or between 11 am and 1 pm?
.....
- What was the average speed (in kilometres per hour) between 4 pm and 6 pm?
.....

- 2 Explain why this cannot be an actual travel graph.

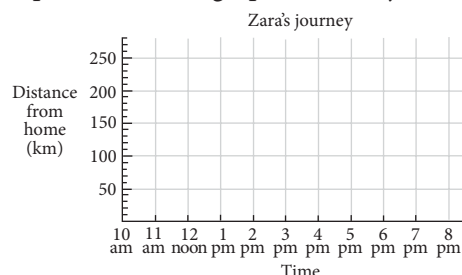


- 3 Julie left Ashleyvale and travelled to Brierton. At the same time, Luke left Brierton and travelled to Ashleyvale. This travel graph was drawn to show the distance each was from Ashleyvale at different times, but has not been completed.



- How far is it from Ashleyvale to Brierton?
.....
- Who had the faster average speed for the journey?
.....

- 4 Zara left home at 10 am and travelled 140 km in 2 hours before stopping for an hour. She then travelled for a further $1\frac{1}{2}$ hours to reach her destination 230 km from home. After stopping for $\frac{3}{4}$ hour she began her journey home, taking a break of $\frac{1}{4}$ hour after travelling for an hour and 45 minutes at a spot 150 km from home. She then travelled straight home, arriving at 7:15 pm. Complete the travel graph of Zara's journey.



1 Length

1 Which unit (millimetres, metres or kilometres) would be used to measure:

- a the length of a road?
- b the height of a tree?
- c the width of a stamp?

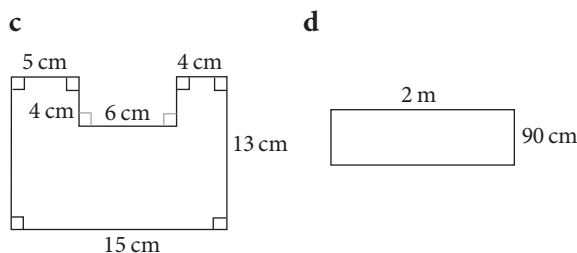
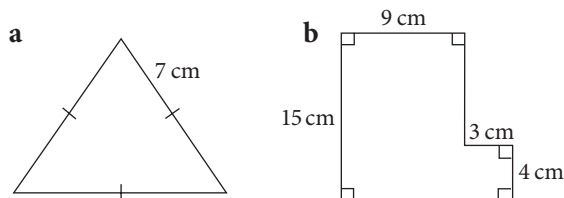
2 Complete:

- a $5 \text{ km} = \underline{\hspace{2cm}} \text{ m}$
- b $7 \text{ cm} = \underline{\hspace{2cm}} \text{ mm}$
- c $9000 \text{ m} = \underline{\hspace{2cm}} \text{ km}$
- d $600 \text{ cm} = \underline{\hspace{2cm}} \text{ m}$
- e $80 \text{ mm} = \underline{\hspace{2cm}} \text{ cm}$
- f $4 \text{ m} = \underline{\hspace{2cm}} \text{ mm}$
- g $300 \text{ mm} = \underline{\hspace{2cm}} \text{ cm}$
- h $2000 \text{ mm} = \underline{\hspace{2cm}} \text{ m}$
- i $70 \text{ km} = \underline{\hspace{2cm}} \text{ m}$
- j $4000 \text{ cm} = \underline{\hspace{2cm}} \text{ m}$
- k $1.4 \text{ km} = \underline{\hspace{2cm}} \text{ m}$
- l $2.7 \text{ cm} = \underline{\hspace{2cm}} \text{ mm}$
- m $5.94 \text{ m} = \underline{\hspace{2cm}} \text{ cm}$
- n $3.8 \text{ m} = \underline{\hspace{2cm}} \text{ mm}$
- o $0.5 \text{ km} = \underline{\hspace{2cm}} \text{ m}$
- p $0.08 \text{ km} = \underline{\hspace{2cm}} \text{ m}$
- q $0.3 \text{ cm} = \underline{\hspace{2cm}} \text{ mm}$
- r $4.65 \text{ cm} = \underline{\hspace{2cm}} \text{ mm}$
- s $0.4 \text{ m} = \underline{\hspace{2cm}} \text{ km}$

3 Use decimal notation to complete:

- a 5 metres and 70 centimetres = $\underline{\hspace{2cm}}$ m
- b 8 centimetres and 9 millimetres = $\underline{\hspace{2cm}}$ cm
- c 16 kilometres and 50 metres = $\underline{\hspace{2cm}}$ km

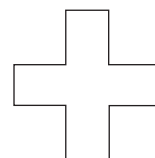
4 Find the perimeter:



5 Find the dimensions of a rectangle if the perimeter is 24 cm and the width is half the length.

6 Two rectangles, both 8 cm long and 2 cm wide, are overlapped and drawn around the outside to produce this shape.

What is the perimeter of the shape?



1 Mass

- 1 Which unit (grams, milligrams, kilograms or tonnes) would be the best to use to measure the mass of a:

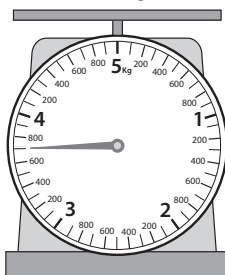
- a bus?
 b pencil?
 c tiger?
 d headache tablet?

- 2 Complete:

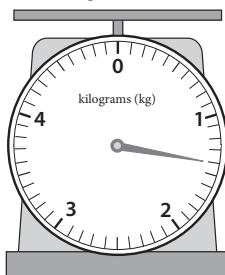
- a $7 \text{ kg} = \underline{\hspace{2cm}} \text{ g}$
 b $15 \text{ t} = \underline{\hspace{2cm}} \text{ kg}$
 c $40\,000 \text{ g} = \underline{\hspace{2cm}} \text{ kg}$
 d $3 \text{ kg} = \underline{\hspace{2cm}} \text{ t}$
 e $600 \text{ g} = \underline{\hspace{2cm}} \text{ kg}$
 f $0.2 \text{ t} = \underline{\hspace{2cm}} \text{ kg}$
 g $0.569 \text{ kg} = \underline{\hspace{2cm}} \text{ g}$
 h $6000 \text{ mg} = \underline{\hspace{2cm}} \text{ g}$
 i $0.38 \text{ g} = \underline{\hspace{2cm}} \text{ mg}$
 j $4.7 \text{ t} = \underline{\hspace{2cm}} \text{ kg}$
 k $450 \text{ g} = \underline{\hspace{2cm}} \text{ kg}$
 l $0.03 \text{ kg} = \underline{\hspace{2cm}} \text{ g}$
 m $3.25 \text{ g} = \underline{\hspace{2cm}} \text{ mg}$

- 3 What is the mass shown by these scales?

a in kilograms



b in grams



- 4 Find the total mass of three items: one weighing 5.4 kg, another 350 g and the other 0.85 kg.

.....

- 5 What is the difference between a mass of 1.2 kg and one of 675 g?

.....

- 6 One litre of water has a mass of 1 kg. Harry's bucket holds 12.5 litres and has a mass of 13.1 kg when filled with water. What is the mass of Harry's empty bucket in grams?

.....

- 7 A truck is carrying 60 identical boxes. The gross (total) mass of the loaded truck is 9.2 t. The net (empty) mass of the truck is 8 t.

a What is the mass of each box in kilograms?

.....

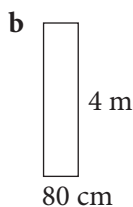
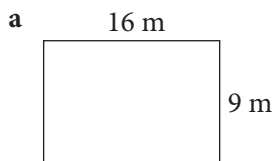
b Each box holds 40 tubs of butter. What is the mass of each tub in grams?

.....

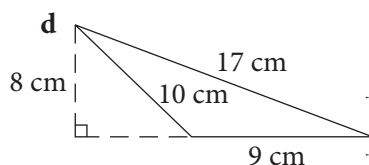
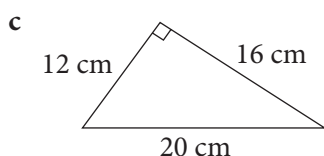
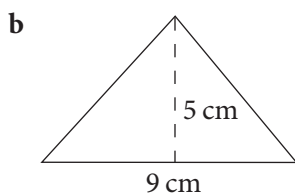
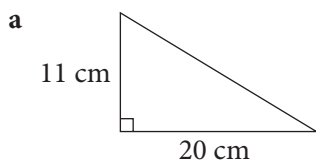
- 8 A box with a mass of 24.2 kg holds packets of noodles. Each packet has a mass of 400 grams and the box itself weighs 200 grams. How many packets are in the box?

.....

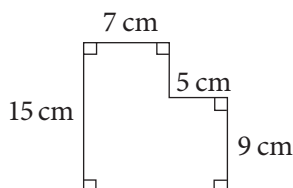
- 1 Find the area, in square metres, of these rectangles.



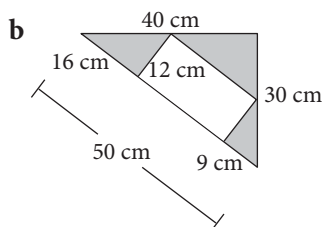
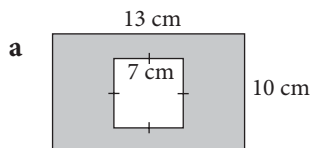
- 2 Find the area of these triangles.



- 3 Find the area.



- 4 Find the shaded area.



- 5 A square has a perimeter of 20 m. What is its area?

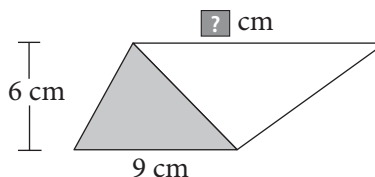
- 6 A rectangular concrete slab is 15 m long and 9 m wide.

a What is the area in square metres?

b If an extra metre was added on all sides, by how much would the area increase?

- 7 A paddock is 200 m long and 50 m wide. What is its area in hectares?

- 8 The area of this quadrilateral is 63 cm^2 .



What is the top length?

1 Volume and Capacity

- 1 Which unit (litres or millilitres) would be best to measure the capacity of a:

a cup?

.....

b wading pool?

.....

- 2 Which unit (cubic metres or cubic centimetres) would be best to measure the volume of a:

a shipping container?

.....

b shoebox?

.....

- 3 Complete:

a 9 L = _____ mL

b 50 000 mL = _____ L

c 0.7 L = _____ mL

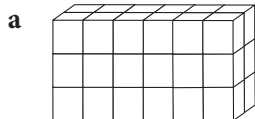
d 12.58 L = _____ mL

e 2 kL = _____ L

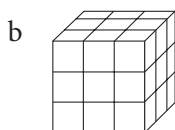
f 925 mL = _____ L

g 36 mL = _____ L

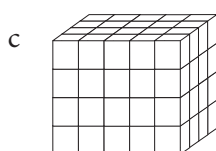
- 4 How many blocks are in each prism?



.....

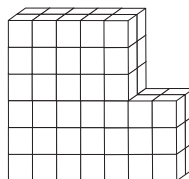


.....



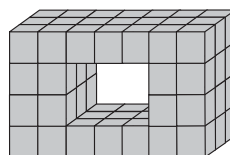
.....

- 5 How many blocks are in this prism?



.....
.....
.....

- 6 A prism has a hole right through it.

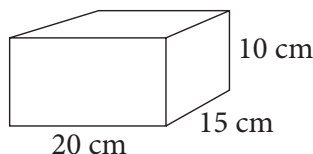


.....
.....
.....

How many blocks are in the object?

- 7 A fish tank is in the shape of a rectangular prism.

- a What is the volume of the tank in cubic centimetres?



.....
.....
.....

- b If $1 \text{ cm}^3 = 1 \text{ mL}$, how many litres will the tank hold when full?

.....

- 8 A rectangular tank is 4 m long, 3 m wide and 1 m high. What is its capacity in litres? ($1 \text{ m}^3 = 1000 \text{ L}$)

.....
.....

- 9 A pool, in the shape of a rectangular prism, holds 500 000 L when full.

- a What is its volume?

.....

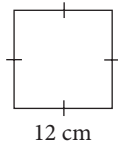
- b If the pool is 2 m deep, suggest a possible length and width.

.....
.....

2 Area and Volume

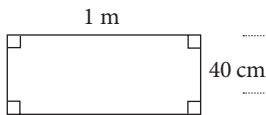
1 Find the area.

a



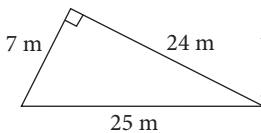
.....
.....
.....

b



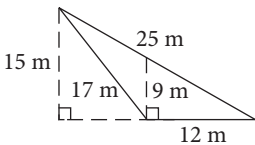
.....
.....
.....

c



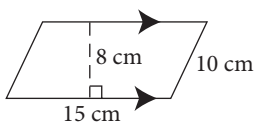
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d



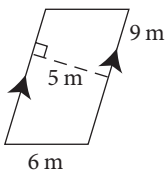
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.....
.....

e



.....
.....
.....

f

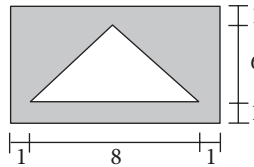


.....
.....
.....

2 A square has perimeter 36 cm. What is its area?

.....
.....

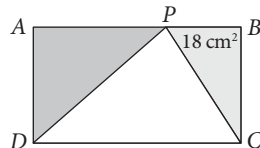
3 Find the shaded area. (All measurements are in centimetres.)



.....
.....
.....

4 This rectangle has been divided into three triangles. The smallest triangle has area 18 cm^2 . The darker shaded triangle has twice that area.

a What is the area of the rectangle?



.....
.....
.....

b If the rectangle is 12 cm long, how wide is it?

.....

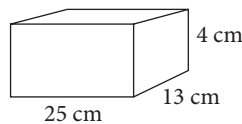
c How long is it from A to P?

.....

5 Find the volume of a cube of side length 5 m.

.....

6 Find the volume of this prism.

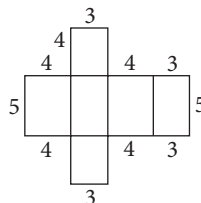


.....
.....
.....

7 A tank is a rectangular prism of length 5 m and width 3 m. When full it holds 60 000 L. What is the height of the tank?

.....
.....

8 This is the net of a rectangular prism. (All measurements are in centimetres.) What would be the volume of the prism?



.....
.....
.....

- 1 Change each of these to 12-hour time (using am or pm):

- a 1530
- b 1915
- c 2145

- 2 Change these to 24-hour time:

- a 1:20 pm
- b 6:35 pm
- c 8:40 am

- 3 How long is it, in hours and minutes, from:

- a 9:15 am to 11:30 am?
.....
- b 4:40 pm to 8:25 pm?
.....
- c 10:35 am to 2:50 pm?
.....
- d 6:48 am to 3:08 pm?
.....
- e 8:50 pm Tuesday to 5:20 pm Friday?
.....

- 4 What is the time:

- a 3 hours 20 minutes after 6:50 am?
.....
- b $5\frac{1}{2}$ hours after 11:20 am?
.....
- c $8\frac{3}{4}$ hours after 10:35 pm?
.....

- 5 Below is a timetable for a train travelling between Newcastle (Broadmeadow) and Sydney (Central).

Broadmeadow	1328
Cardiff	1336
Morisset	1403
Wyong	1419
Gosford	1436
Hornsby	1520
Central	1556

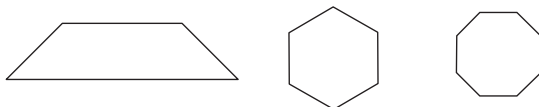
- a At what time (in 12-hour time) does the train leave Broadmeadow?
.....
- b How long does the train take to travel from:
(i) Hornsby to Central?
- (ii) Cardiff to Gosford?
- c Another train leaves Broadmeadow at about twenty to seven in the evening. At around what time will it get to Central if it stops at all the same stations?
.....
.....

- 6 Below is part of a bus timetable.

	A am	B am	C am	D am
Ann St	7:25	7:40	7:55	8:10
Park Rd	7:35	7:50	8:05	8:20
High St	7:45	7:58	8:13	8:28
Oak Pl	7:52	8:07	8:22	8:37
City	8:00	8:17	8:32	8:47

- a At what time is Bus A at Oak Place?
.....
- b At how many minutes before 9:00 am is Bus D at the city?
.....
- c Ken needs to be in the city before half past eight. What is the latest time he can catch the bus at Park Rd?
.....
.....

- 1 a Give the special name for each of the shapes below.



- b Which one of the shapes in part a has no lines of symmetry?

- c Which shape has no rotational symmetry?

- 2 a Draw in the diagonals for each of the shapes below.



- b Name the shapes in part a that have diagonals that meet at right angles?

- c Which of the shapes have diagonals that are equal in length?

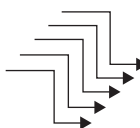
- 3 The diagram below was made by joining seven identical shapes at their edges.



- a What type of shape was used?

- b Draw in all lines of symmetry.

- 4 What type of transformation is used in this pattern?

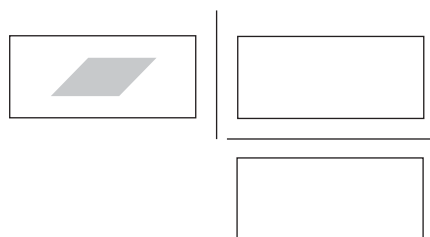


- 5 A pattern is formed by rotating the arrow through 90° in an anticlockwise direction. Fill in the next three steps in the pattern.



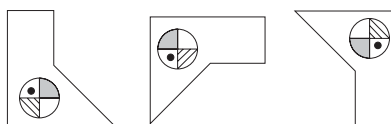
- 6 This card is reflected across the vertical line and then across the horizontal line.

- a Draw the result at each step.

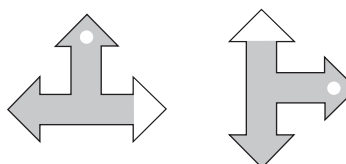


- b What single transformation could produce the same end result?

- 7 Draw the next shape in this pattern.

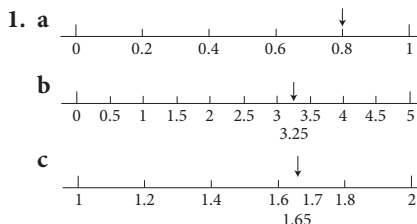


- 8 Name two different pairs of transformations that could, together, change the first shape into the second.



Mixed Decimals

Level 1 (page 25)



2. 0.2

[Write each decimal with the same number of places after the decimal point.]

0.20 is larger than 0.17.

3. 23 650 000

23.65 million is 23 650 000.

4. 0.079, 0.508, 0.56, 0.6

0.6 = 0.600 0.508

0.56 = 0.560 0.079

5. a 0.9

$$\begin{array}{r} 0.6 \\ + 0.3 \\ \hline 0.9 \end{array}$$

b 0.6

$$\begin{array}{r} 0.8 \\ - 0.2 \\ \hline 0.6 \end{array}$$

c 2.1

$$\begin{array}{r} 0.7 \\ \times 3 \\ \hline 2.1 \end{array}$$

d 10.8

$$\begin{array}{r} 1.2 \\ \times 9 \\ \hline 10.8 \end{array}$$

e 0.2

$$\begin{array}{r} 0.2 \\ 4 \overline{)0.8} \end{array}$$

f 3.54

$$\begin{array}{r} 1.20 \\ + 2.34 \\ \hline 3.54 \end{array}$$

g 2.53

$$\begin{array}{r} 5 \text{ } 13 \text{ } 1 \\ 6.40 \\ - 3.87 \\ \hline 2.53 \end{array}$$

h 246.9

$$\begin{array}{r} 123.45 \\ \times 2 \\ \hline 246.90 \end{array}$$

i 0.63

$$\begin{array}{r} 0.63 \\ 9 \overline{)5.67} \end{array}$$

j 7.45

$$\begin{array}{r} 7.45 \\ 8 \overline{)59.60} \end{array}$$

6. Yes, the numbers round to 20, 25, 85 and 30 and these add to 160, so the answer must be about 160.

7. a 17.3

$$7.3 + 10.0 = 17.3$$

b 73

[Move the decimal point one place to the right.]

$$7.3 \times 10 = 73$$

c 0.73

[Move the decimal point one place to the left.]

$$7.3 \div 10 = 0.73$$

d 52 470

[Move the decimal point two places to the right.]

$$524.7 \times 100 = 52\,470$$

e 6.519

[Move the decimal point two places to the left.]

$$651.9 \div 100 = 6.519$$

f 0.8

[Move the decimal point two places to the right.]

$$0.008 \times 100 = 0.8$$

g 0.0005

[Move the decimal point three places to the left.]

$$0.5 \div 1000 = 0.0005$$

h 64 300

[Move the decimal point three places to the right.]

$$64.3 \times 1000 = 64\,300$$

8. a 2.8

$$2 \times (0.8 + 0.6) = 2 \times 1.4 = 2.8$$

b 0.7

$$(3 \times 0.9) - (5 \times 0.4) = 2.7 - 2.0 = 0.7$$

c 9.71

$$24.04 \div 4 + 3.7 = 6.01 + 3.7 = 9.71$$

9. a \$8.50



$$\begin{array}{l} \text{Cost of dog food} = 5 \times \$1.70 \\ = \$8.50 \end{array}$$

b \$7.00

$$\text{Cost of bread} = 2 \times \$3.50 = \$7.00$$

c \$7.35

$$\text{Cost of juice} = 3 \times \$2.45 = \$7.35$$

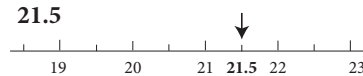
d \$22.85

$$\begin{array}{l} \text{Total cost} = \$8.50 + \$7.00 + \$7.35 \\ = \$22.85 \end{array}$$

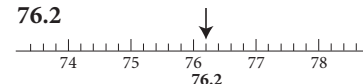
Mixed Operations with Decimals

Level 2 (page 26)

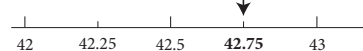
1. a 21.5



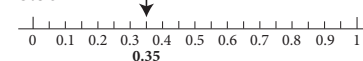
b 76.2



c 42.75

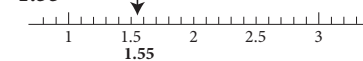


d 0.35



Halfway between 0.3 and 0.4 is 0.35.

e 1.55



Halfway between 1.5 and 1.6 is 1.55.

2. 0.08, 0.175, 0.2, 0.32

Write each decimal with the same number of places after the decimal point.

0.320 0.200 0.080 0.175

So, in order, the numbers are 0.08, 0.175, 0.2 and 0.32.

3. a 56.66

$$\begin{array}{r} 37.20 \\ + 19.46 \\ \hline 56.66 \end{array}$$

b 7.43

$$\begin{array}{r} 16.80 \\ - 9.37 \\ \hline 7.43 \end{array}$$

4. a 28.81

/

$$6.7 \times 4.3 = 28.81$$

[There must be 2 numbers after the decimal point.]

b 0.028 81

$$0.043 \times 0.67 = 0.028\,81$$

[There must be 5 numbers after the decimal point.]

c 288.1

$$0.067 \times 4300 = 6.7 \times 43 = 288.1$$

5. a 1407

$$2.345 \times 600 = 234.5 \times 6 = 1407$$

b 11

$$25.3 \div 2.3 = 253 \div 23 = 11$$

6. a 6.8

$$\begin{array}{l} 0.97 \times 6.8 + 0.03 \times 6.8 \\ = (0.97 + 0.03) \times 6.8 \\ = 1 \times 6.8 \\ = 6.8 \end{array}$$

b 872.4

$$\begin{array}{l} 87.24 \times 12.7 - 2.7 \times 87.24 \\ = 87.24 \times (12.7 - 2.7) \\ = 87.24 \times 10 \\ = 872.4 \end{array}$$

c 76.5

$$5 \times 7.65 \times 2 = 5 \times 2 \times 7.65 \\ = 10 \times 7.65 \\ = 76.5$$

d 13 380

$$4 \times 133.8 \times 25 = 133.8 \times 25 \times 4 \\ = 133.8 \times 100 \\ = 13\,380$$

e 0

$$6.28 \times 7.49 \times 3.62 \times 0 \times 1.83 = 0$$

7. 1.5025

$$\text{Total} = 3.24 + 1.93 + 0.78 + 0.06 = 6.01 \\ \begin{array}{r} 3.24 \\ 1.93 \\ 0.78 \\ + 0.06 \\ \hline 6.01 \end{array}$$

$$\text{Average} = 6.01 \div 4 = 1.5025$$

$$\begin{array}{r} 1.5025 \\ 4 \overline{)6.0100} \end{array}$$

8. 5

As $5 \times 6 = 30$, 5 loads will supply more than 30 m^3 .

Try 4 loads: $4 \times 6.8 = 27.2$

So 4 loads is not enough. There needs to be one more load so 5 loads are needed.

9. 254.0625

$$81.3 \div 0.32 = 8130 \div 32 = 254.0625$$

10. 71.4

$$\text{Number of times greater} = 321.3 \div 4.5 \\ = 3213 \div 45$$

[We know that 3213 is divisible by 9 because its digits add to 9 ($3 + 2 + 1 + 3 = 9$). 45 is also divisible by 9 so simplify the question by dividing both parts by 9.]

$$= 357 \div 5 \\ = 71.4$$

Rounding Off

Level 2 (page 27)

- a 600
b 1200
c 203 900
- a 518
b 11
c 6
- a \$2.80
b \$184.55
c \$49.05
d \$0.30
- a 0.7
b 0.5
c 11.2
d 5.2
e 158.0
- a 9.12
b 13.56
c 2.15

d 6.49

e 142.67

6. a 0.947

b 15.626

c 0.488

d 123.502

e 67.390

7. 7.57

$$2 \times 3.7845 = 7.5690 \\ = 7.57 \quad [2 \text{ d.p.}]$$

8. a 261.81

$$\begin{array}{r} 17.23580 \\ 9.41625 \\ + 235.15700 \\ \hline 261.80905 \end{array}$$

Sum is 261.81 to two decimal places.

b 261.82

$$\begin{array}{r} 17.24 \\ 9.42 \\ + 235.16 \\ \hline 261.82 \end{array}$$

c The answers are not the same. The first answer is more accurate.

9. a \$44.17

$$265 \div 6 = \$44.166... \\ \text{Each will pay } \$44.17 \quad \begin{array}{r} 44.166 \\ 6 \overline{)265.000} \end{array}$$

to the nearest cent.

b \$35

\$44.17 rounded up to the nearest \$10 is \$50. If they pay \$50 each they would have \$300 in total and would have \$35 to spend on petrol.

Percentages and Discounts

Level 1 (page 28)

- a \$80
 $10\% \text{ of } \$800 = \$800 \div 10 = \$80$
b \$40
 $5\% \text{ of } \$800 = \$80 \div 2 = \$40$
c \$120
 $15\% \text{ of } \$800 = \$80 + \$40 = \$120$
- a \$45
 $50\% \text{ of } \$90 = \$90 \div 2 = \$45$
b \$22.50
 $25\% \text{ of } \$90 = \$45 \div 2 = \$22.50$
c \$67.50
 $75\% \text{ of } \$90 = 3 \times \$22.50 = \$67.50$
- a \$300
 $10\% \text{ of } \$3000 = \$3000 \div 10 = \$300$
b \$600
 $20\% \text{ of } \$3000 = 2 \times \$300 = \$600$
c \$2100
 $70\% \text{ of } \$3000 = 7 \times \$300 = \$2100$
- a \$12
 $10\% \text{ of } \$60 = \$6$
 $20\% \text{ of } \$60 = \$6 \times 2 = \$12$
b \$64
 $50\% \text{ of } \$128 = \$128 \div 2 = \$64$
c \$5
 $25\% \text{ of } \$20 = \$20 \div 4 = \$5$

d \$1200

$$10\% \text{ of } \$4000 = \$400 \\ 30\% \text{ of } \$4000 = \$400 \times 3 = \$1200$$

e \$4.50

$$50\% \text{ of } \$9 = \$9 \div 2 = \$4.50$$

f \$1.70

$$10\% \text{ of } \$17 = \$17 \div 10 = \$1.70$$

g \$15

$$10\% \text{ of } \$300 = \$30 \\ 5\% \text{ of } \$300 = \$30 \div 2 = \$15$$

h \$480

$$10\% \text{ of } \$1200 = \$120 \\ 40\% \text{ of } \$1200 = \$120 \times 4 = \$480$$

i \$7.50

$$10\% \text{ of } \$50 = \$50 \div 10 = \$5 \\ 5\% \text{ of } \$50 = \$5 \div 2 = \$2.50 \\ \text{So } 15\% \text{ of } \$50 = \$5.00 + \$2.50 \\ = \$7.50.$$

5. a \$252

$$\text{Discount} = 30\% \text{ of } \$840 = \$252 \\ [\$84 \times 3]$$

b \$588

$$\text{Amount paid} = \$840 - \$252 = \$588$$

6. a \$18

$$\text{Savings} = 20\% \text{ of } \$90 = \$18$$

b \$168

$$\text{Discount} = 20\% \text{ of } \$210 = \$42 \\ \text{Price paid} = \$210 - \$42 = \$168$$

7. \$0

100% is the whole price so a 100% discount means Renae pays nothing.

8. first shop, by \$3

$$15\% \text{ of } \$120 = \$12 + \$6 = \$18 \\ \text{Price paid for first pair} = \$120 - \$18 \\ = \$102$$

$$30\% \text{ of } \$150 = \$15 \times 3 = \$45$$

$$\text{Price of second pair} = \$150 - \$45 \\ = \$105$$

So the first shop has the cheapest shoes, but only by \$3.

Percentages

Level 2 (page 29)

- a 4
 $10\% \text{ of } 40 = 40 \div 10 = 4$
b 30
 $50\% \text{ of } 60 = 60 \div 2 = 30$
c 20
 $25\% \text{ of } 80 = 80 \div 4 = 20$
- a 33
 $\frac{75^3}{100^4} \times \frac{44^{11}}{1} = 33$
b 6
 $\frac{20}{100} \times \frac{30}{1} = 6$
c 15
 $\frac{5}{100} \times \frac{300}{1} = 15$

d 3

$$\frac{15^3}{100} \times \frac{20}{1} = 3$$

e 49

$$\frac{70}{100} \times \frac{70}{1} = 49$$

f \$54 000

$$\frac{90}{100} \times \frac{\$60\,000}{1} = \$54\,000$$

g \$700

$$\frac{35}{100} \times \frac{\$2000}{1} = \$700$$

h \$0.56

$$\frac{7}{100} \times \frac{800c}{1} = 56c = \$0.56$$

3. a 75%

$$\frac{30}{40} \times 100\% = \frac{3}{4} \times 100\% = 75\%$$

b 70%

$$\frac{56}{80} \times 100\% = 70\%$$

c 80%

$$\frac{36}{45} \times 100\% = 80\%$$

d 20%

$$\frac{40}{200} = \frac{20}{100} = 20\%$$

e 5%

$$\frac{8}{160} \times 100\% = 5\%$$

f 72%

$$\frac{72}{100} = 72\%$$

g 82.5%

$$\frac{825}{1000} = \frac{82.5}{100} = 82.5\%$$

h 70%

$$\frac{42}{60} \times 100\% = 70\%$$

4. 17%

Cars on road = 20% of 140 = 28

Trucks on road = 10% of 60 = 6

Total on road = 28 + 6 = 34

Total vehicles = 140 + 60 = 200

Percentage on road = $\frac{34}{200} = \frac{17}{100} = 17\%$

5. a \$20

Discount = \$80 - \$60 = \$20

b 25%

% discount = $\frac{20}{80} \times 100\% = 25\%$

c \$90

25% of \$120 = \$120 ÷ 4 = \$30

Price paid = \$120 - \$30 = \$90

6. 54

$$\text{Students on excursion} = \frac{60}{100} \times 120 = 72$$

$$\text{Now } 75\% \text{ of } 72 = \frac{3}{4} \times 72 = 18 \times 3 = 54$$

There were 54 female students on the excursion.

Comparing Fractions, Decimals and Percentages

Level 1 (page 30)

1. a 0.7

b 0.23

c 0.09

d 0.5

e 0.25

2. a $\frac{9}{10}$ b $\frac{7}{50}$

$$0.14 = \frac{14}{100} = \frac{7}{50}$$

c $\frac{1}{20}$

$$0.05 = \frac{5}{100} = \frac{1}{20}$$

d $\frac{3}{4}$

$$0.75 = \frac{75}{100} = \frac{3}{4}$$

e $\frac{4}{5}$

$$0.8 = \frac{8}{10} = \frac{4}{5}$$

3. a 27%

b 50%

c 90%

d 35%

$$\frac{7}{20} = \frac{35}{100} = 35\%$$

e 45%

f 368%

g 750%

h 5%

4. a 0.56

b 0.03

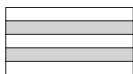
c 1.25

d 0.8

5. a $\frac{87}{100}$ b $1\frac{1}{2}$ c $\frac{3}{4}$ d $\frac{1}{10}$

6. 40%

$$\text{Shaded amount} = \frac{2}{5} = 40\%$$

7. a $\frac{17}{20}$

$$\frac{17}{20} = \frac{85}{100} = 85\%$$

85% is greater than $82\frac{1}{2}\%$

b They are the same.

$$\frac{3}{5} = \frac{6}{10} = 0.6 \quad \text{They are the same.}$$

c 275%

275% = 2.75 so is greater than 2.7.

8. a 17%

Jim pays 17% of his earnings in tax.

b $\frac{1}{5}$

Jamie is taxed at 20%.

$$20\% = \frac{2}{10} = \frac{1}{5}$$

So Jamie pays $\frac{1}{5}$ of his earnings in tax.9. $\frac{1}{4}$

48% + 27% = 75%

So $\frac{3}{4}$ of the tickets are not green. $\frac{1}{4}$ of the tickets are green.

10. 4%

$$\text{Oil in fuel} = \frac{0.04}{1} = \frac{4}{100} = 4\%$$

Conversions between Fractions, Decimals and Percentages

Level 2 (page 31)

1. a 83%

b 90%

c 7%

d 250%

e 12.5%

2. a $\frac{4}{5}$

$$0.8 = \frac{8}{10} = \frac{4}{5}$$

b $\frac{7}{20}$

$$0.35 = \frac{35}{100} = \frac{7}{20}$$

c $1\frac{1}{25}$

$$1.04 = 1\frac{4}{100} = 1\frac{1}{25}$$

d $\frac{3}{8}$

$$0.375 = \frac{375}{1000} = \frac{75}{200} = \frac{3}{8}$$

e $\frac{53}{100}$ f $\frac{3}{5}$

$$60\% = \frac{60}{100} = \frac{6}{10} = \frac{3}{5}$$

g $\frac{1}{25}$

$$4\% = \frac{4}{100} = \frac{1}{25}$$

h $2\frac{1}{2}$

$$250\% = \frac{250}{100} = 2\frac{1}{2}$$

i $\frac{1}{8}$

$$12.5\% = \frac{12.5}{100} = \frac{125}{1000} = \frac{5}{40} = \frac{1}{8}$$

3. a 0.72

b 0.3

c 0.01

d 0.037

e 1.4

4. a 40%

$$\frac{2}{5} = \frac{40}{100} = 40\%$$

b 85%

$$\frac{17}{20} = \frac{85}{100} = 85\%$$

c 24.6%

$$\frac{123}{500} = \frac{123}{500} \times \frac{100}{1} = 24.6\%$$

d 175%

$$1\frac{3}{4} = 1\frac{75}{100} = 175\%$$

e 87.5%

$$\frac{7}{8} = \frac{7}{8} \times \frac{100}{1} = 87.5\%$$

5. a 0.625

$$\frac{5}{8} = 0.625 \quad \begin{array}{r} 0.625 \\ 8 \overline{)5.000} \end{array}$$

b 0.3

$$\frac{1}{3} = 0.3 \quad \begin{array}{r} 0.333... \\ 3 \overline{)1.000} \end{array}$$

c 0.4

$$\frac{4}{9} = 0.4 \quad \begin{array}{r} 0.4444... \\ 9 \overline{)4.0000} \end{array}$$

d 0.416

$$\frac{5}{12} = 0.416 \quad \begin{array}{r} 0.41666... \\ 12 \overline{)5.00000} \end{array}$$

e 0.428571

$$\frac{3}{7} = 0.428571 \quad \begin{array}{r} 0.42857142... \\ 7 \overline{)3.00000000} \end{array}$$

6. They are all the same.

$$1\frac{1}{5} = 1\frac{2}{10} = 1.2$$

$$120\% = 1.2$$

1.2, $1\frac{1}{5}$, and 120% all have the same value.

7. 0.01%

$$\begin{aligned} \text{Chance} &= \frac{1}{10000} \\ &= \frac{1}{10000} \times \frac{100}{1} \\ &= \frac{1}{100}\% \\ &= 0.01\% \end{aligned}$$

8. Redland

$$\frac{5}{7} \times \frac{100}{1} = \frac{500}{7}\% = 71.4285...\%$$

So Redland has around 71% of male politicians. It has the lower male representation so must also have the higher female representation.

Ratios

Level 2 (page 32)

1. a 3 : 2

b 2 : 1

c 1 : 3

d 3 : 1

e 2 : 3

f 1 : 2

2. a 4 : 3

b 3 : 1

c 1 : 10

d 6 : 5

e 8 : 9

f 2 : 1

g 5 : 3

h 11 : 5

$$2\frac{3}{4} : 1\frac{1}{4} = \frac{11}{4} : \frac{5}{4} = 11 : 5$$

i 10 : 3

$$\frac{2}{3} : \frac{1}{5} = \frac{10}{15} : \frac{3}{15} = 10 : 3$$

j 32 : 17

k 4 : 7

$$1.6 : 2.8 = 16 : 28 = 4 : 7$$

l 7 : 10

m 5 : 1

$$3 : 0.6 = 30 : 6 = 5 : 1$$

3. a 1 : 4

$$15 \text{ minutes} : 60 \text{ minutes} = 15 : 60 = 1 : 4$$

b 100 : 1

$$100 \text{ cm to } 1 \text{ cm} = 100 : 1$$

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

$$\text{Fraction that is boys} = \frac{3}{3+4} = \frac{3}{7}$$

5. 36

$$5 : 3 = 60 : 36$$

[5 has been multiplied by 12 to get 60 so 3 must also be multiplied by 12.]
So 36 new cars were for sale.

6. a 72

$$12 : 7 = 72 : 42$$

[7 has been multiplied by 6 to get 42 so 12 must also be multiplied by 6.]
So there were 72 cats at the shelter.

b 9 : 5

$$\text{New number of cats} = 72 + 18 = 90$$

$$\text{New number of dogs} = 42 + 8 = 50$$

$$\text{New ratio} = 90 : 50 = 9 : 5$$

7. \$12 000 : \$8000

$$\text{Number of shares} = 3 + 2 = 5$$

$$\text{Each share} = \$20\,000 \div 5 = \$4000$$

$$3 \text{ shares} = 3 \times \$4000 = \$12\,000$$

$$2 \text{ shares} = 2 \times \$4000 = \$8000$$

8. 84

$$\text{Number of parts} = 4 + 7 = 11$$

$$\text{Each part} = 132 \div 11 = 12$$

$$\text{Green parts} = 7$$

$$\text{Number of green apples} = 7 \times 12 = 84$$

Best Buys

Level 2 (page 33)

1. a \$21.50

$$5 \text{ for } \$107.50 = \$21.50 \text{ each}$$

$$\begin{array}{r} 21.50 \\ 5 \overline{)107.50} \end{array}$$

b \$7.45

$$3 \text{ for } \$22.35 = \$7.45 \text{ each}$$

$$\begin{array}{r} 7.45 \\ 3 \overline{)22.35} \end{array}$$

c \$1.56

$$7 \text{ for } \$10.92 = \$1.56 \text{ each}$$

$$\begin{array}{r} 1.56 \\ 7 \overline{)10.92} \end{array}$$

d \$1.20

$$15 \text{ for } \$18.00 = \$1.20 \text{ each}$$

$$[18 \div 15 = 6 \div 5 = 1.2]$$

2. 5 kg for \$7.95

$$2 \text{ kg for } \$3.24 = 1 \text{ kg for } \$1.62$$

$$5 \text{ kg for } \$7.95 = 1 \text{ kg for } \$1.59$$

So 5 kg for \$7.95 is the better buy.

$$\begin{array}{r} 1.62 \\ 2 \overline{)3.24} \end{array} \quad \begin{array}{r} 1.59 \\ 5 \overline{)7.95} \end{array}$$

3. \$1.40

$$3.5 \div 2.5 = 7 \div 5 = 14 \div 10 = 1.4$$

So the price per litre is \$1.40.

4. \$5.30

$$500 \text{ g for } \$2.65 = 1000 \text{ g for } \$5.30$$

So the price is \$5.30 per kilogram.

5. 3L for \$5.40

$$5 \text{ L for } \$9.25 = \$1.85 \text{ per litre}$$

$$3 \text{ L for } \$5.40 = \$1.80 \text{ per litre}$$

$$2 \text{ L for } \$3.80 = \$1.90 \text{ per litre}$$

$$\begin{array}{r} 1.85 \\ 5 \overline{)9.25} \end{array} \quad \begin{array}{r} 1.80 \\ 3 \overline{)5.40} \end{array} \quad \begin{array}{r} 1.90 \\ 2 \overline{)3.80} \end{array}$$

The best buy is 3 L for \$5.40.

6. All are the same price.

$$8 \text{ kg for } \$11.60 = \$1.45 \text{ per kilogram}$$

$$12 \text{ kg for } \$17.40 = \$1.45 \text{ per kilogram}$$

$$20 \text{ kg for } \$29.00 = \$1.45 \text{ per kilogram}$$

$$\begin{array}{r} 1.45 \\ 8 \overline{)11.60} \end{array} \quad \begin{array}{r} 1.45 \\ 12 \overline{)17.40} \end{array} \quad \begin{array}{r} 1.45 \\ 2 \overline{)29.00} \end{array}$$

All are the same price.

7. 2 L for \$25.50

500 mL for \$6.45 = \$12.90 per litre

2 L for \$25.50 = \$12.75 per litre

2.5 L for \$32.35 = \$12.94 per litre

$[32.35 \div 2.5 = 64.7 \div 5 = 12.94 \div 10]$

The best buy is 2 L for \$25.50.

8. \$8.40

4 rolls for \$2.80 = 70 cents each

6 rolls for \$4.50 = 75 cents each

So if Tracy buys 3 lots of 4 rolls she will pay the least amount.

Now $12 \times 70c = \$8.40$ so the cheapest amount Tracy needs to pay is \$8.40.

9. \$29.50

3 kg for \$10.00 is \$3.33... per kg.

5 kg for \$16.00 is \$3.20 per kg.

So Maggie should buy 5 kg + 3 kg + 1 kg as the cheapest way to make 9 kg.

Cheapest price

= \$16.00 + \$10.00 + \$3.50

= \$29.50

Patterns

Level 1 (page 34)

1. a 31

$$27 + 4 = 31$$

b 65

$$72 - 7 = 65$$

c 486

$$162 \times 3 = 486$$

d 5.9

$$5.2 + 0.7 = 5.9$$

e $\frac{3}{4}$

$$\frac{1}{8}, \frac{1}{4}, \frac{3}{8}, \frac{1}{2}, \frac{5}{8} \Rightarrow \frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}$$

$$\text{Next number} = \frac{6}{8} = \frac{3}{4}$$

f 1

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

2. a 168

$$162 + 6 = 168$$

b 6.2

$$7 - 0.8 = 6.2$$

c $\frac{3}{10}$

$$\frac{1}{10}, \frac{1}{5}, \frac{2}{5}, \frac{1}{2}, \frac{3}{5} \Rightarrow \frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}$$

d 15

$$30 \div 2 = 15$$

$$30, 15, 7.5, 3.25, 1.625$$

3. a 9

Stage 5 has $7 + 2 = 9$ squares.

b 28

Stage 5 has $22 + 6 = 28$ matchsticks.

c 11

Stage 6 has $9 + 2 = 11$ squares.

d 34

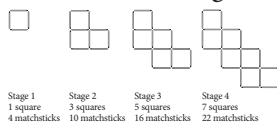
Stage 6 has $28 + 6 = 34$ matchsticks.

e Number of squares

$$= 2 \times \text{number of stages} - 1$$

f Number of matchsticks

$$= 6 \times \text{number of stages} - 2$$



4. a 21

Stage 4 has $16 + 5 = 21$ matches.

b 26

Stage 5 has $21 + 5 = 26$ matches.

c The number of matches at each stage is one more than five times the number of the stage.

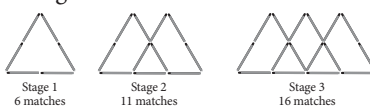
d 501

Stage 100 uses $5 \times 100 + 1$ or 501 matches.

e Stage 20

$$101 = 100 + 1 = 5 \times 20 + 1$$

So Stage 20 will use 101 matches.



5. a $\triangle = \triangle \times 3 + 2$

b

	1	2	4	5	8	10
	5	8	14	17	26	32

Algebra

Level 2 (page 35)

1. a $2x$

$$x + x = 2x \quad [1x + 1x]$$

b $2a$

$$2 \times a = 2a$$

c $8p$

$$3p + 5p = 8p$$

d $12d$

$$4 \times 3d = 12d$$

e $4k$

$$9k - 5k = 4k$$

f $7n$

$$n \times 7 = 7n$$

g $2y$

$$3y - y = 2y$$

h $14t$

$$7t \times 2 = 14t$$

i z

$$6z - 5z = z \quad [1z]$$

j $2b$

$$8b \div 4 = 2b$$

k g^2

$$g \times g = g^2$$

l pq

$$p \times q = pq$$

m $6ab$

$$2a \times 3b = 6ab$$

n $3a$

$$\frac{15a}{5} = 3a$$

o $\frac{h}{2}$

$$\frac{6h}{12} = \frac{h}{2}$$

p $\frac{2m}{3}$

$$\frac{8m}{12} = \frac{2m}{3}$$

2. a 9

$$\text{If } a = 4, a + 5 = 4 + 5 = 9.$$

b 12

$$\text{If } a = 4, 3a = 3 \times 4 = 12.$$

c 7

$$\text{If } a = 4,$$

$$2a - 1 = 2 \times 4 - 1 = 8 - 1 = 7.$$

d 2

$$\text{If } a = 4, \frac{a}{2} = \frac{4}{2} = 2.$$

e 16

$$\text{If } a = 4, a^2 = 4^2 = 16.$$

f 8

$$\text{If } a = 4, 12 - a = 12 - 4 = 8.$$

3. a 41

$$\text{If } x = 3 \text{ and } y = 5,$$

$$2x + 7y = 2 \times 3 + 7 \times 5 = 6 + 35 = 41.$$

b 60

$$\text{If } x = 3 \text{ and } y = 5,$$

$$4xy = 4 \times 3 \times 5 = 60.$$

c -2

$$x - y = 3 - 5 = -2$$

d 16

$$2(x + y) = 2(3 + 5) = 2 \times 8 = 16$$

4. a -1

$$p + q = -2 + 1 = -1$$

b -3

$$p - q = -2 - 1 = -3$$

c 5

$$3q - p = 3 \times 1 - (-2) = 3 + 2 = 5$$

d -7

$$p - 5q = -2 - 5 \times 1 = -2 - 5 = -7$$

5. a $5x + 4y$

$$2x + 3x + 4y = 5x + 4y$$

b $8p + 2q$

$$5p + 2q + 3p = 8p + 2q$$

c $6t - 3u$

$$6t - 3u = 6t - 3u \quad [\text{It can't be simplified.}]$$

d $7m + 2$

$$4m + 2 + 3m = 7m + 2$$

e $14 - 7n$

$$9 - 7n + 5 = 14 - 7n$$

f $7x^2$

$$5x^2 + 2x^2 = 7x^2$$

g $13m - 6n$

$$7m + 5m - 6n + m = 13m - 6n$$

h $7y + z$

$$9y - 2y + 4z - 3z = 7y + z$$

i $12p - 5q$

$$12p - 3q + 2q - 4q = 12p - 5q$$

j $9x - 9y$

$$7x + 2x - 4y - 5y = 9x - 9y$$

6. a $a + 3$
 b $p - 6$
 c $100x$
 d $x + y$
 The sum of x and $y = x + y$

Number Sentences and Equations

Level 2 (page 36)

1. a 6
 $5 + 6 = 11$
 b 8
 $12 - 8 = 4$
 c 6
 $6 \times 3 = 18$
 d 48
 $48 \div 2 = 24$
 e 4
 $16 \times 2 = 8 \times 4$
 f 10
 $9 + 7 = 10 + 6$
 g 20
 $20 - 9 = 11$
 h 9
 $6 + 9 = 21 - 6$

2. $\diamond = 5 \times \text{Apple} - 2$

Apple	1	2	4	8	13	20
$\diamond$	3	8	18	38	63	98

[When Apple = 4,
 $\diamond = 5 \times 4 - 2 = 20 - 2 = 18$.
 When $\diamond = 38$, $5 \times \text{Apple} - 2 = 38$
 so $5 \times \text{Apple} = 40$ and Apple = 8.
 When Apple = 13,
 $\diamond = 5 \times 13 - 2 = 65 - 2 = 63$.
 When $\diamond = 98$, $5 \times \text{Apple} - 2 = 98$
 so $5 \times \text{Apple} = 100$ and Apple = 20.]

3. 20
 If Mary had 4 more marbles she would have the same as Ken. If Erin had 14 more marbles she would have the same as Ken and all three would have the same amount.
 Now $42 + 4 + 14 = 60$
 and $60 \div 3 = 20$.
 So Ken must have 20 marbles.

4. 4
 After Jack subtracted 3 he had an answer of 15 so before he subtracted 3 he must have had an answer of 18. So, before doubling, his answer must have been 9 and before adding 5 he must have started with 4.

5. 14
 The number of oranges is 19 more than the number of lemons. So taking away 19 from the total will give twice the number of lemons.

Now $47 - 19 = 28$ and $28 \div 2 = 14$.
 So there must have been 14 lemons (and 33 oranges).

6. 18
 [The difference between 56 and 20 will be twice ☺.]
 Now $56 - 20 = 36$ and $36 \div 2 = 18$.
 So ☺ must represent 18.
 $56 - 18 = 20 + 18$

7. a

x	1	2	3	5	9	10	20
$x + 6$	7	8	9	11	15	16	26

[$2 + 6 = 8$; $3 + 6 = 9$; $5 + 6 = 11$ and so on]

b

x	0	1	4	8	10	25
$2x + 1$	1	3	9	17	21	51

[$2 \times 0 + 1 = 1$; $2 \times 1 + 1 = 3$;
 $2 \times 4 + 1 = 9$ and so on]

c

x	1	2	4	5	6	9
$3x - 2$	1	4	10	13	16	25

[$3 \times 1 - 2 = 1$; $3 \times 2 - 2 = 4$; $3 \times 4 - 2 = 10$ and so on]

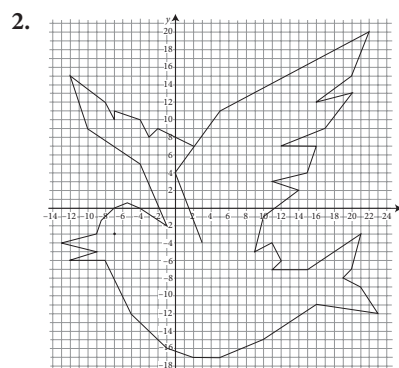
8. a true
 $8 + 3 = 11$
 b true
 $5 \times 3 - 2 = 15 - 2 = 13$
 c false
 $2 \times 8 + 7 = 16 + 7 = 23$ (not 9)
 d true
 $13 - 4 \times \frac{1}{2} = 13 - 2 = 11$
9. a $x = 5$
 $x + 8 = 13$ [Subtract 8 from both sides.]
 $x = 5$
 b $a = 30$
 $a - 9 = 21$ [Add 9 to both sides.]
 $a = 30$
 c $x = 4$
 $7x = 28$ [Divide both sides by 7.]
 $x = 4$
 d $x = 50$
 $\frac{x}{5} = 10$ [Multiply both sides by 5.]
 $x = 50$
 e $y = 4$
 $7 - y = 3$
 Now $7 - 4 = 3$ so $y = 4$.
 f $z = -1$
 $15 + z = 14$
 $z = 14 - 15$
 $= -1$
10. a $m = 5$
 $3m + 4 = 19$
 $3m = 15$
 $m = 5$
 b $n = 7$
 $6n - 5 = 37$
 $6n = 42$
 $n = 7$

- c $t = 9$
 $\frac{2t}{3} = 6$
 $2t = 18$ [multiply both sides by 3]
 $t = 9$ [divide both sides by 2]
 d $p = 4$
 $9 - 2p = 1$
 $2p = 8$ [because we know
 $p = 4$ that $9 - 8 = 1$]

Coordinates

Level 1 (page 37)

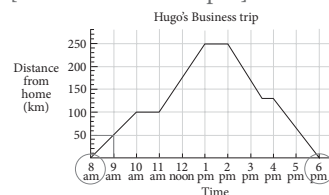
1. a (i) C (ii) K (iii) J
 b (i) $(-2, 3)$ (ii) $(4, -3)$ (iii) $(-2, -4)$



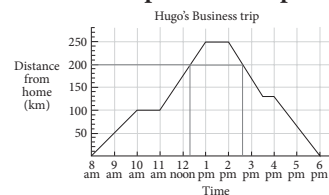
Travel Graphs

Level 2 (page 38)

1. a 8 am
 b 10 hours
 [From 8 am until 6 pm]



- c 50 km
 d That Hugo was stopped
 e $2\frac{1}{2}$ hours
 Time stopped = $1 \text{ h} + 1 \text{ h} + \frac{1}{2} \text{ h}$
 $= 2\frac{1}{2} \text{ h}$
 f 2 pm
 [When the distance from home starts to decrease]
 g About 12:20 pm and 2:40 pm



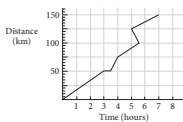
- h From 11 am to 1 pm
 [From 11 am to 1 pm Hugo travels further in the same amount of time. It is also when the graph is steeper.]

i 65 km/h

Between 4 pm and 6 pm, Hugo travelled 130 km.
Now 130 km in 2 hours = 65 km in 1 hour

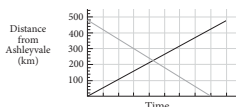
Average speed = 65 km/h

2. It is not possible to be in two different places at the same time (or to travel backwards in time).



3. a 480 km

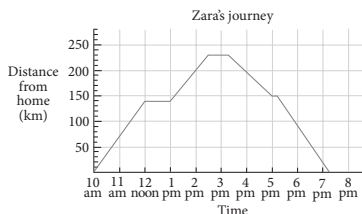
[Julie left Ashleyvale and travelled to Brierton so her line is the line that goes up and Luke left Brierton and travelled to Ashleyvale so his line goes down. Luke began at a distance of 480 km from Ashleyvale so that is the distance of Brierton from Ashleyvale.]



b Luke

[Both travelled the same distance. Luke completed the journey in less time so he must have had the faster average speed.]

4.



Length

Level 1 (page 39)

1. a kilometres (km)
b metres (m)
c millimetres (mm)
2. a 5000
b 70
c 9
d 6
e 8
f 4000
g 30
h 2
i 70 000
j 40
k 1400
l 27
m 594
n 3800
o 500
p 80
q 3
r 46.5
s 0.0004

3. a 5.7

b 8.9

c 16.05

4. a 21 cm

Perimeter = $3 \times 7 \text{ cm} = 21 \text{ cm}$

b 54 cm

Perimeter = $(2 \times 15 + 2 \times 12) \text{ cm}$
 $= (30 + 24) \text{ cm}$
 $= 54 \text{ cm}$

c 64 cm

Perimeter = $2 \times (15 + 13 + 4) \text{ cm}$
 $= 2 \times 32 \text{ cm}$
 $= 64 \text{ cm}$

d 5.8 m

Perimeter = $(2 \times 2 + 2 \times 0.9) \text{ m}$
 $= (4 + 1.8) \text{ m}$
 $= 5.8 \text{ m}$ [Or 580 cm]

5. 8 cm, 4 cm

Perimeter = 24 cm

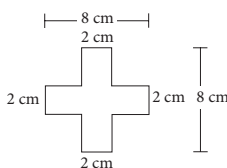
Length + width = 12 cm

But the length is twice the width, so the length is 8 cm and the width is 4 cm.

6. 32 cm

On each side the total length is 8 cm.

Perimeter = $4 \times 8 \text{ cm} = 32 \text{ cm}$



Mass

Level 1 (page 40)

1. a tonnes (t)
b grams (g)
c kilograms (kg)
d milligrams (mg)
2. a 7000
b 15 000
c 40
d 0.003
e 0.6
f 200
g 569
h 6
i 380
j 4700
k 0.45
l 30
m 3250
3. a 3.7 kg



b 1400 g



4. 6.6 kg

350 g = 0.35 kg

Total mass = $(5.4 + 0.35 + 0.85) \text{ kg}$
 $= 6.6 \text{ kg}$

5. 525 g

1.2 kg = 1200 grams

Difference = $1200 - 675 = 525 \text{ g}$

6. 600 g

12.5 L of water has a mass of 12.5 kg.

Mass of empty bucket

$= (13.1 - 12.5) \text{ kg} = 0.6 \text{ kg} = 600 \text{ g}$

7. a 20 kg

Mass of the load

$= (9.2 - 8) \text{ t} = 1.2 \text{ t} = 1200 \text{ kg}$

Mass of each box = $(1200 \div 60) \text{ kg}$
 $= 20 \text{ kg}$

b 500 g

Mass of each tub

$= (20 \div 40) \text{ kg} = 0.5 \text{ kg} = 500 \text{ g}$

8. 60

200 g = 0.2 kg

Total mass of packets = 24 kg

$= 24\,000 \text{ g}$

Number of packets

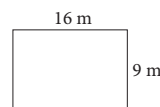
$= 24\,000 \div 400 = 240 \div 4 = 60$

Area

Level 1 (page 41)

1. a 144 m²

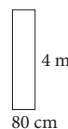
Area = $16 \text{ m} \times 9 \text{ m}$
 $= 144 \text{ m}^2$



b 3.2 m²

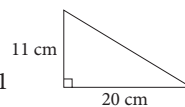
80 cm = 0.8 m

Area = 4×0.8
 $= 3.2 \text{ m}^2$



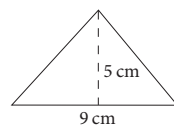
2. a 110 cm²

$A = \frac{1}{2}bh$
 $= \frac{1}{2} \times 20 \times 11$
 $= 110 \text{ cm}^2$



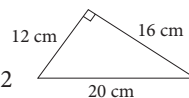
b 22.5 cm²

$A = \frac{1}{2}bh$
 $= \frac{1}{2} \times 9 \times 5$
 $= 22.5 \text{ cm}^2$



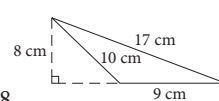
c 96 cm²

$A = \frac{1}{2}bh$
 $= \frac{1}{2} \times 16 \times 12$
 $= 96 \text{ cm}^2$



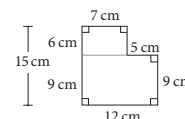
d 36 cm²

$A = \frac{1}{2}bh$
 $= \frac{1}{2} \times 9 \times 8$
 $= 36 \text{ cm}^2$



3. 150 cm²

$A = 12 \times 9 + 7 \times 6$
 $= 108 + 42$
 $= 150 \text{ cm}^2$

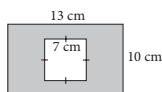


4. a **81 cm²**

$$A = 13 \times 10 - 7^2$$

$$= 130 - 49$$

$$= 81 \text{ cm}^2$$



b **300 cm²**

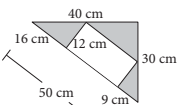
$$\text{Length of rectangle} = 50 - 16 - 9$$

$$= 25 \text{ cm}$$

$$A = \frac{1}{2} \times 40 \times 30 - 25 \times 12$$

$$= 600 - 300$$

$$= 300 \text{ cm}^2$$



5. **25 m²**

$$\text{Length of each side} = 20 \div 4 = 5 \text{ m}$$

$$\text{Area} = 5^2 = 25 \text{ m}^2$$

6. a **135 m²**

$$A = 15 \times 9 = 135 \text{ m}^2$$

b **52 m²**

$$\text{New area} = 17 \times 11 = 187 \text{ m}^2$$

$$\text{Increase} = 187 - 135 = 52 \text{ m}^2$$

7. **1 ha**

$$A = 200 \text{ m} \times 50 \text{ m} = 10\,000 \text{ m}^2 = 1 \text{ ha}$$

8. **12 cm**

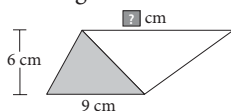
Shaded triangle:

$$A = \frac{1}{2} \times 9 \times 6 = 27 \text{ cm}^2$$

$$\text{Remaining area} = 63 - 27 = 36 \text{ cm}^2$$

$$\text{So } \frac{1}{2} \times 6 \times ? = 36 \text{ or } 3 \times ? = 36$$

$$\text{But } 3 \times 12 = 36 \text{ so the top must be } 12 \text{ cm in length.}$$



Volume and Capacity

Level 1 (page 42)

1. a **millilitres (mL)**

b **litres (L)**

2. a **cubic metres (m³)**

b **cubic centimetres (cm³)**

3. a **9000 mL**

b **50 L**

c **700 mL**

d **12 580 mL**

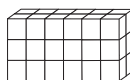
e **2000 L**

f **0.925 L**

g **0.036 L**

4. a **36**

$$\text{Number of blocks} = 6 \times 2 \times 3 = 36$$



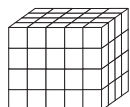
b **27**

$$\text{Number of blocks} = 3 \times 3 \times 3 = 27$$



c **80**

$$\text{Number of blocks} = 5 \times 4 \times 4 = 80$$

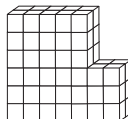


5. **72**

$$\text{Number of blocks} = 7 \times 2 \times 3 + 5 \times 2 \times 3$$

$$= 42 + 30$$

$$= 72$$

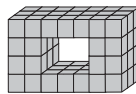


6. **66**

$$\text{Number of blocks} = 7 \times 3 \times 4 - 3 \times 3 \times 2$$

$$= 84 - 18$$

$$= 66$$

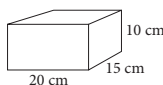


7. a **3000 cm³**

$$V = 20 \times 15 \times 10 = 3000 \text{ cm}^3$$

b **3 L**

$$3000 \text{ cm}^3 = 3000 \text{ mL} = 3 \text{ L}$$



8. **12 000 L**

$$V = 4 \times 3 \times 1 = 12 \text{ m}^3$$

$$\text{Capacity is } 12\,000 \text{ L.}$$

9. a **500 m³**

$$\text{Capacity} = 500\,000 \text{ L}$$

$$\text{So volume} = 500 \text{ m}^3$$

b **possibly 25 m long and 10 m wide**

$$500 \div 2 = 250$$

So the length and width multiply to 250.

A possibility is length 25 m and width 10 m.

[Or any that multiply to 250]

Area and Volume

Level 2 (page 43)

1. a **144 cm²**

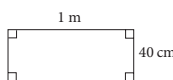
$$A = 12^2 = 144 \text{ cm}^2$$



b **4000 cm²**

$$A = 100 \text{ cm} \times 40 \text{ cm} = 4000 \text{ cm}^2$$

$$[\text{Or } A = 1 \text{ m} \times 0.4 \text{ m} = 0.4 \text{ m}^2]$$



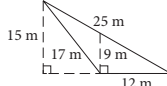
c **84 m²**

$$A = \frac{1}{2} \times 24 \times 7 = 12 \times 7 = 84 \text{ m}^2$$



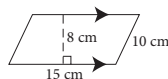
d **90 m²**

$$A = \frac{1}{2} \times 12 \times 15 = 6 \times 15 = 90 \text{ m}^2$$



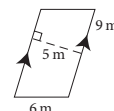
e **120 cm²**

$$A = 15 \times 8 = 120 \text{ cm}^2$$



f **45 m²**

$$A = 9 \times 5 = 45 \text{ m}^2$$



2. **81 cm²**

$$\text{Each side} = 36 \div 4 = 9 \text{ cm}$$

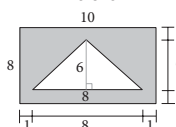
$$\text{Area} = 9^2 = 81 \text{ cm}^2$$

3. **56 cm²**

$$\text{Shaded area} = (10 \times 8 - \frac{1}{2} \times 8 \times 6) \text{ cm}^2$$

$$= (80 - 24) \text{ cm}^2$$

$$= 56 \text{ cm}^2$$



4. a **108 cm²**

$$\text{Area of shaded triangle} = 2 \times 18 \text{ cm}^2$$

$$= 36 \text{ cm}^2$$

[The area of $\triangle PDC$ is half the area of the rectangle so the total area of the other triangles is half the area of the rectangle.]

Area of rectangle

$$= 2 \times (18 + 36) \text{ cm}^2$$

$$= 2 \times 54 \text{ cm}^2$$

$$= 108 \text{ cm}^2$$

b **9 cm**

$$12 \times 9 = 108 \text{ so the rectangle is } 9 \text{ cm wide.}$$

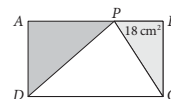
c **8 cm**

The area of $\triangle APD$ is twice that of $\triangle PBC$. But both triangles have the same height. So AP must be twice as long as PB .

$$AP = 8 \text{ cm}$$

$$PB = 4 \text{ cm}$$

It is 8 cm from A to P .

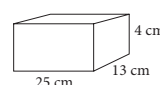


5. **125 m³**

$$V = 5^3 = 125 \text{ m}^3$$

6. **1300 cm³**

$$V = 25 \times 13 \times 4 = 100 \times 13 = 1300 \text{ cm}^3$$



7. **4 m**

$$60\,000 \text{ L} = 60 \text{ m}^3$$

$$\text{So } 5 \times 3 \times \text{height} = 60$$

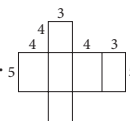
$$\text{height} = 60 \div 15$$

$$= 4 \text{ m}$$

8. **60 cm³**

$$\text{The prism is } 5 \text{ cm long, } 4 \text{ cm wide and } 3 \text{ cm high.}$$

$$V = 5 \times 4 \times 3 = 60 \text{ cm}^3$$



Time

Level 1 (page 44)

1. a **3:30 pm**

b **7:15 pm**

c **9:45 pm**

2. a **1320**

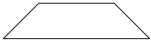
b **1835**

c **0840**

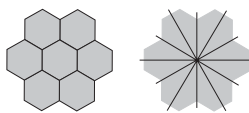
3. a **2 hours 15 minutes**
 b **3 hours 45 minutes**
 It is 3 hours from 4:40 pm to 7:40 pm, another 20 minutes until 8:00 pm and then another 25 minutes.
 c **4 hours 15 minutes**
 It is 4 hours from 10:35 am to 2:35 pm, then another 15 minutes to 2:50 pm.
 d **8 hours 20 minutes**
 e **68 hours 30 minutes**
4. a **10:10 am**
 3 hours after 6:50 am is 9:50 am.
 20 minutes after that is 10:10 am.
 b **4:50 pm**
 c **7:20 am**
5. a **1:28 pm**
 $1328 = 1:28 \text{ pm}$
 b (i) **36 minutes**
 From 1520 to 1556 is 36 minutes.
 (ii) **1 hour**
 From 1336 to 1436 is 1 hour.
- c **9:10 pm**
 The train takes about $2\frac{1}{2}$ hours to travel from Broadmeadow to Central. So the train that leaves Broadmeadow at twenty to seven should arrive at Central at around ten past nine.
6. a **7:52 am**
 b **13 minutes**
 Bus D is at the city at 8:47 am.
 This is 13 minutes before 9 o'clock.
 c **7:50 am**
 Bus B is the last bus that reaches the city before 8:30. This leaves Park Rd at 7:50am.

Two-dimensional Shapes and Transformations

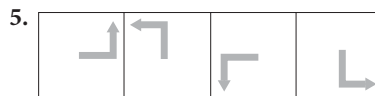
Level 1 (page 45)

1. a   
 rectangle square parallelogram
  
 trapezium hexagon octagon
 b **parallelogram**
 c **trapezium**
2. a    
 b **square, rhombus**
 c **square, rectangle**

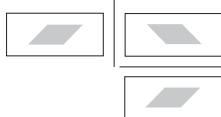
3. a **hexagon**
 b



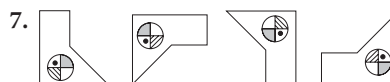
4. **translation**



6. a



- b **rotation through 180° or translation**



8. **Rotating clockwise 90° and reflecting in a horizontal line.**
Rotating anticlockwise 90° and reflecting in a vertical line.