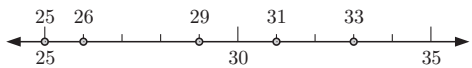
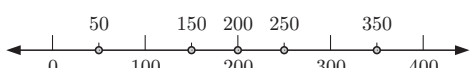


Answers

1A PLACE VALUE

- 1 a 4 tens or 40 b 4 units or 4 c 4 hundreds or 400
d 4 thousands or 4000 e 4 ten thousands or 40 000
- 2 a 300 b 10 000 c 7000 d 400 000 e 2 f 0
- 3 a 378 b 50 623 c 925 041
- 4 a $500 + 40 + 2$ b $20\,000 + 300 + 10 + 7$
c $300\,000 + 10\,000 + 5000 + 60$
- 5 a two hundred and twenty
b six thousand, four hundred, and fifteen
c thirty seven thousand, eight hundred, and three
- 6 a 3022 b 98 401

1B NUMBER LINES

- 1 a 17 b 100 c 50 and 65 d 225 and 250
- 2 a $5 > 1$ b $4 < 7$ c $9 < 12$ d $20 > 14$
- 3 
25, 26, 29, 31, 33
- 4 
350, 250, 200, 150, 50

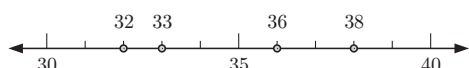
1C BIG NUMBERS

- | billions | | | millions | | | thousands | | | units | | |
|----------|---|---|----------|---|---|-----------|---|---|-------|---|---|
| H | T | U | H | T | U | H | T | U | H | T | U |
| 1 | 3 | 4 | 5 | 0 | 7 | 7 | 8 | 4 | 9 | 1 | 2 |
- 2 a 500 000 000 b 4 000 000 000 c 10 000 000 000 000
- 3 a fifty two million, four hundred and seven thousand
b forty seven billion, two hundred and ten million
- 4 a 15 000 000 b 1 083 206 917 000

1D ROUNDING NUMBERS

- 1 a 60 b 310 c midway d 2030
- 2 a 30 and 40 b 210 and 220 c 490 and 500
d 1640 and 1650
- 3 a 40 b 90 c 160 d 560 e 2140 f 12 840
- 4 a 200 b 3700
- 5 a 600 b 2600 c 81 300
- 6 a 1000 b 3000 c 49 000
- 7 a 30 000 b 450 000
- 8 a 400 000 b 1 500 000
- 9 a 62 520 b 62 500 c 63 000 d 60 000
- 10 a 30 students b 400 km c \$30 000

REVIEW OF CHAPTER 1

- 1 a 20 b 20 000 000
- 2 $3000 + 700 + 50 + 1$ 3 25 613 4 10, 16, and 22
- 5 
32, 33, 36, 38
- 6 sixty four billion, one hundred and ten million, nine hundred and fifty thousand
- 7 6 650 000
- 8 a 300 b 4400 c midway
- 9 a 30 players b 400 000

2A ADDITION

- 1 a 29 b 41 2 a 138 b 159
- 3 a
$$\begin{array}{r} 2\ 0\ 7 \\ +\ 5\ 1\ 4 \\ \hline 7\ 2\ 1 \end{array}$$
 b
$$\begin{array}{r} 8\ 1\ 6\ 5 \\ +\ 1\ 9\ 0\ 3 \\ \hline 9\ 0\ 6\ 8 \end{array}$$
- c
$$\begin{array}{r} 4\ 6\ 2\ 5 \\ 3\ 0\ 9 \\ +\ 1\ 9\ 13\ 1 \\ \hline 5\ 8\ 6\ 5 \end{array}$$
- 4 a 89 b 513 c 1857
- 5 373 km 6 5812 calories

2B SUBTRACTION

- 1 a 15 b 9
- 2 a 18 b 43 c 171
- 3 a
$$\begin{array}{r} 4\cancel{8}\ 18\cancel{8} \\ -\ 2\ 9 \\ \hline 2\ 9 \end{array}$$
 b
$$\begin{array}{r} 8\ 8\cancel{17}\cancel{7} \\ -\ 3\ 2\ 8 \\ \hline 5\ 6\ 9 \end{array}$$
- c
$$\begin{array}{r} \cancel{14}\cancel{8}\ 13\cancel{13}\cancel{12}\cancel{2} \\ -\ 8\ 7\ 5 \\ \hline 6\ 6\ 7 \end{array}$$
- 4 a 62 b 303 c 972
- 5 a 76 b 782
- 6 66 kg 7 157 mL

2C MULTIPLICATION

- 1 a 108 b 120
- 2 a 270 b 5800 c 214 000
- 3 a 28 b 280 c 2800 d 28 000
- 4 a 1700 b 2600 c 29 000 d 13 000
- 5 1200 screws

2D COLUMN MULTIPLICATION

- 1 a
$$\begin{array}{r} 8\ 3 \\ \times\ 1\ 6 \\ \hline 4\ 9\ 8 \end{array}$$
 b
$$\begin{array}{r} 4\ 5 \\ \times\ 3\ 7 \\ \hline 3\ 1\ 5 \end{array}$$
- c
$$\begin{array}{r} 2\ 6 \\ \times\ 1\ 8 \\ \hline 2\ 4\ 0\ 8 \\ +\ 2\ 6\ 0 \\ \hline 4\ 6\ 8 \end{array}$$
 d
$$\begin{array}{r} 3\ 4 \\ \times\ 2\ 3 \\ \hline 1\ 0\ 2 \\ +\ 6\ 8\ 0 \\ \hline 7\ 8\ 2 \end{array}$$

- 2 a 378 b 5512 3 \$175
 4 a 320 marbles b 480 g c 3840 g

2E DIVISION

- 1 a 7 b 11
 2 a 500 b 72 c 260 d 9140 e 317 f 420
 3 a 9 b 90 c 900 d 9000
 4 a
$$6 \overline{) 1642}$$
 b
$$8 \overline{) 3172}$$

 c
$$7 \overline{) 1817}$$
 d
$$9 \overline{) 48654}$$

 5 a 41 b 114 6 a 62 r 4 b 279 r 5
 7 \$26 8 a \$112 b \$96 c \$84

2F PROBLEMS WITH MULTIPLE OPERATIONS

- 1 a \$819 b \$315 2 a 45 km b 1350 km
 3 18 minutes 4 a 904 cm b yes; 96 cm 5 2740 minutes

2G INDEX NOTATION

- 1 a 5^3 b 6^5
 2 a $3^4 \times 5^3$ b $2^4 \times 9^2$ c $8^3 \times 7^3 \times 4$
 3 a 10^4 b 10^9
 4 a 49 b 32 c 72 d 200
 5 yes

2H ORDER OF OPERATIONS

- 1 a 15 b 2 c 32 d 16
 2 a 26 b 1 c 61 d 25
 3 a 33 b 27 c 2
 4 a 17 b 18 c 19
 5 a 54 b 5 c 5 d 16
 6 a 2 b 24 c 25 d 4
 7 a $9 \times 3 - 2 = 25$ b $(15 \div 3) \times 8 = 40$
 c $6 + (20 \div 5) = 10$

REVIEW OF CHAPTER 2

- 1 a 18 b 54
 2 a
$$\begin{array}{r} 1736 \\ + 1497 \\ \hline 2233 \end{array}$$
 b
$$\begin{array}{r} 34927 \\ - 2831 \\ \hline 1196 \end{array}$$

 3 a 311 b 159 c 2200 d 19000
 4 51 points 5 \$83 6 a 17000 b 2600
 7 a
$$\begin{array}{r} 28 \\ \times 23 \\ \hline 284 \\ + 1560 \\ \hline 644 \end{array}$$
 b
$$3 \overline{) 972}$$

 8 \$1908 9 a 5 b 54 10 \$694
 11 a 7^6 b $4^3 \times 9^4$
 12 a 39 b 7 c 9 d 24 e 8 f 2

3A LINES

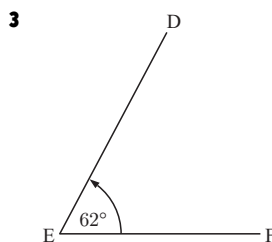
- 1 (RS), (SR), (RT), (TR), (ST), (TS)
 2 a [DE] b [RS] c (XY)
 3 a M b N c L
 4 a Q b Q and R c R d (PQ) and (TR)

3B ANGLES

- 1 a \widehat{ABC} (or \widehat{CBA}), acute b \widehat{PQS} (or \widehat{SQP}), obtuse
 c \widehat{VUX} (or \widehat{XUV}), acute
 2 a acute b obtuse c reflex d reflex

3C MEASURING ANGLES

- 1 a 103° b 38°
 2 $\widehat{PQR} = 57^\circ$, $\widehat{PRQ} = 41^\circ$, $\widehat{QPR} = 82^\circ$



- 4 a $\widehat{PQR} = 127^\circ$, $\widehat{PSR} = 125^\circ$ b \widehat{PQR}

3D CALCULATING ANGLES

- 1 a i 90° ii right b i 34° ii acute
 2 a $x = 31$ b $x = 138$ c $x = 30$
 3 a $a = 287$ b $b = 73$ c $c = 70$

3E VERTICALLY OPPOSITE ANGLES

- 1 \widehat{EBF}
 2 a $d = 114$ b $e = 46$ c $f = 69$, $g = 55$

REVIEW OF CHAPTER 3

- 1 [KL] 2
 3 a \widehat{JKL} (or \widehat{LKJ}), acute b \widehat{PQR} (or \widehat{RQP}), obtuse
 4 a obtuse b reflex c acute d straight
 5 21° 6 155° , obtuse
 7 a $x = 53$ b $y = 48$ c $c = 36$ d $z = 98$

4A ZERO AND ONE

- 1 a 12 b 12 c 17 d 0 e undefined f 0
 2 a 25 b 57 c 14 d 29
 3 a 24 b 120 c 20 d 15 e 19 f undefined

4B SQUARE NUMBERS

- 1 $7 \times 7 = 49$
 $7^2 = 49$
 2 16, 25, 36 3 121 4 25, 36 5 441 6 576

4C CUBIC NUMBERS

1 a  b 125

2 27, 64, 125 3 27, 125

4D TRIANGULAR NUMBERS

1 a  b 45

2 168

3 a i 36 ii 49

b The result of adding two consecutive triangular numbers is a square number.

4E DIVISIBILITY

1 a yes b yes c no
 2 a even b odd c even d odd
 3 45 4 20 5 16, 18, 20
 6 5 and 11, 3 and 13, 1 and 15 7 even

4F DIVISIBILITY TESTS

1 a no b yes 2 30, 40
 3 a yes b no 4 15, 20, 25, 30
 5 a no b yes
 6 a 0 b 0, 2, 4, 6, 8 c 1, 4, 7 d 4

4G FACTORS

1 a yes b no
 2 a 1, 3, 5, 15 b 1, 2, 3, 6, 9, 18
 3 a yes b no c yes
 4 a $36 = 4 \times 9$ b $50 = 10 \times 5$ c $48 = 6 \times 8$
 d $75 = 5 \times 15$
 5 a 1, 3, 13, 39 b 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60
 6 a 2 factors b 8 factors

4H PRIME AND COMPOSITE NUMBERS

1 a composite b prime c composite d composite
 e prime f composite g prime h composite
 2 11, 13, 17, 19, 23, 29
 3 The sum of its digits is a multiple of 3, so it is divisible by 3.
 4 8, 9
 5 a 1, 3, 5, 9, 15, 45 b 3, 5 c $45 = 3 \times 3 \times 5$
 6 a $8 = 2 \times 2 \times 2$ b $50 = 2 \times 5 \times 5$

4I HIGHEST COMMON FACTOR

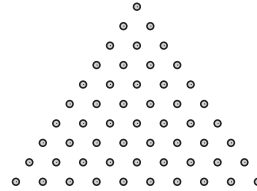
1 a 3 b 7 c 6
 2 a 7 b 5 red lollies, 8 blue lollies

4J MULTIPLES

1 33, 44, 55, 66, 77, 88
 2 a 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48
 b 10, 20, 30, 40, 50 c 20
 3 312

REVIEW OF CHAPTER 4

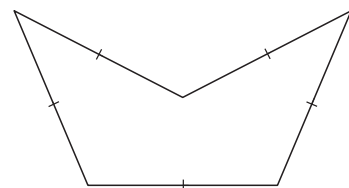
1 a 21 b 13 c 0 d undefined
 2 a 45 b 4, 49 3 1 and 64
 4 a b 55



5 0, 2, 22; 0, 4, 20; 0, 6, 18; 0, 8, 16; 0, 10, 14; 2, 4, 18;
 2, 6, 16; 2, 8, 14; 2, 10, 12; 4, 6, 14; 4, 8, 12; 6, 8, 10
 6 a 2, 5, 8 b 2, 6 7 1, 2, 3, 4, 6, 8, 12, 16, 24, 48
 8 a prime b composite c composite d prime
 9 14 10 72, 75, 78, 81, 84, 87, 90, 93, 96, 99

5A POLYGONS

1 a quadrilateral b octagon c heptagon
 2 a it crosses itself b sides are not all straight
 3 a Regular, as sides are equal *and* angles are equal.
 b Irregular, as sides are not all equal.
 4 **Note:** Other answers are possible.



5 Regular, all sides are 55 mm long, and all angles are 90° .

5B TRIANGLES

1 a scalene b isosceles c isosceles d equilateral
 2 a equilateral; with all sides 17 mm
 b isosceles; with two sides 21 mm, other side 12 mm
 c scalene; sides are 3 cm, 4 cm, and 5 cm

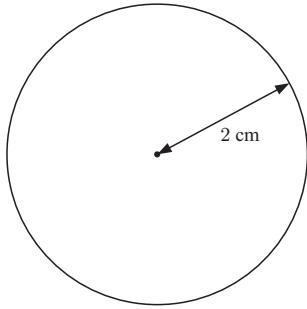
5C QUADRILATERALS

1 a rhombus b trapezium c kite d parallelogram
 2 a true b false c true d false
 3 a $AC = 85$ mm, $BD = 85$ mm
 b The diagonals are equal in length.

5D CIRCLES

1 1.5 cm

2

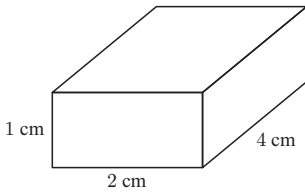


5E SOLIDS

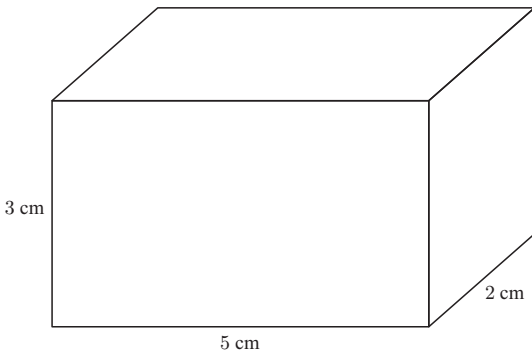
- 1 a cylinder b rectangular prism
 2 a rectangular prism b sphere
 3 a A b C c A

5F DRAWING SOLIDS

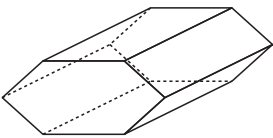
1 a



b

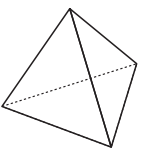


2 a

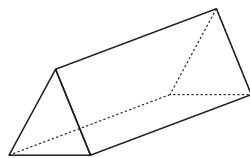


b hexagonal prism

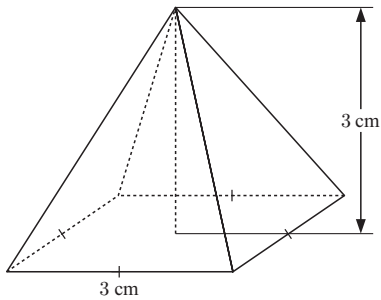
3 a



b



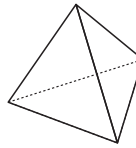
4



5G NETS OF SOLIDS

- 1 a yes b no

2 a



triangular-based pyramid

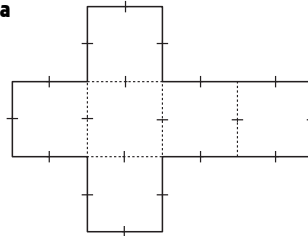
b



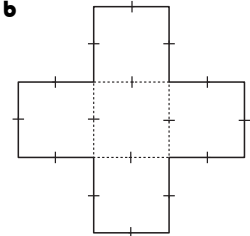
cylinder

3 Note: Other answers are possible.

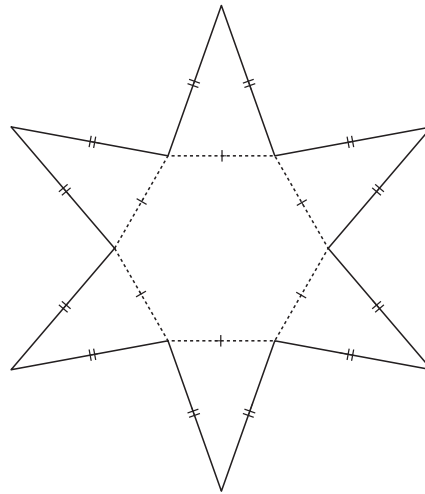
a



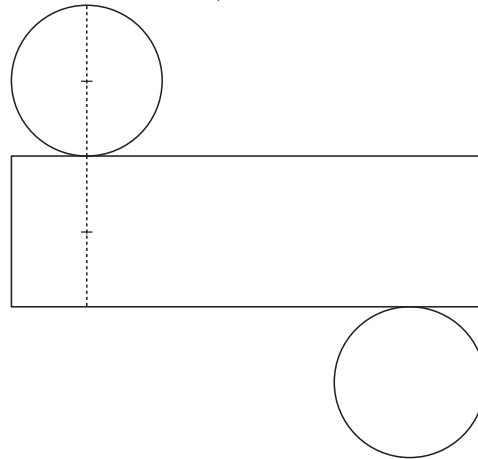
b



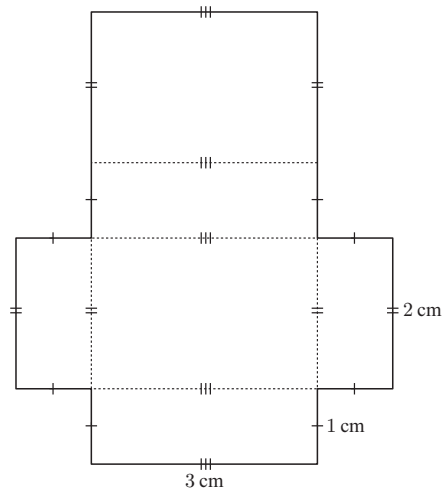
4 Note: Other answers are possible.



5



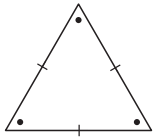
6 Note: Other answers are possible.



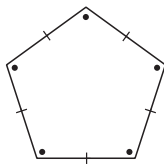
REVIEW OF CHAPTER 5

1 a pentagon b decagon

2 a

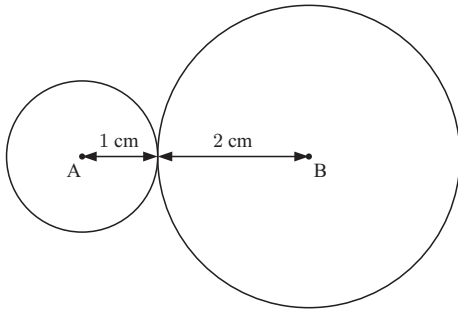


b



3 a isosceles b scalene

4



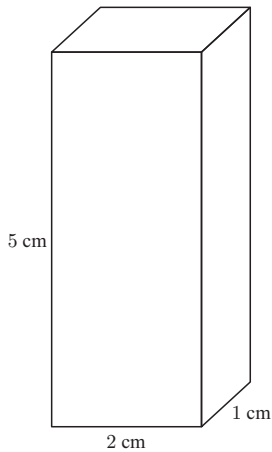
5 a parallelogram b trapezium

6 a false b true

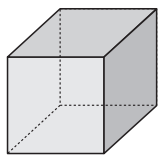
7 a cone b hexagonal-based pyramid

8 cube

9

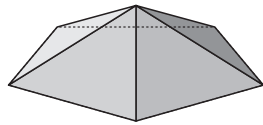


10 a



cube

b



pentagonal-based pyramid

c



cone

6A

FRACTIONS

1 a 4 b 1 2 a 10 b 50

3 a $\frac{1}{5}$ b $\frac{5}{6}$ c $\frac{4}{9}$ d $\frac{7}{10}$ e $\frac{2}{100}$ f $\frac{9}{1000}$

4 a one quarter b six sevenths c seven tenths

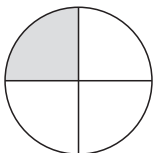
d three twentieths e twenty one hundredths

f fifteen thousandths

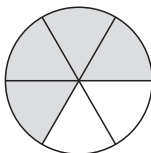
5 a $\frac{1}{6}$ b $\frac{3}{4}$ c $\frac{5}{8}$ d $\frac{7}{16}$

6 No, the 8 parts are not all of equal size.

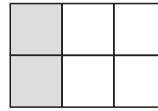
7 a



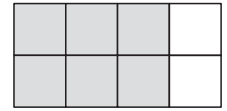
b



8 a



b



9 a The box is two fifths full of oats.

b The cup is one quarter full of water.

10 $\frac{5}{12}$

11 a i $\frac{3}{10}$ ii $\frac{2}{10}$

b i $\frac{4}{10}$ ii $\frac{6}{10}$

c i $\frac{3}{4}$ ii $\frac{4}{6}$

6B

FRACTIONS AS DIVISION

1 a $\frac{5}{6}$ b $\frac{2}{7}$ 2 a $3 \div 8$ b $7 \div 15$

3 a $15 \div 3 = 5$ b $21 \div 21 = 1$ c $81 \div 9 = 9$

d $0 \div 5 = 0$

6C

PROPER AND IMPROPER FRACTIONS

1 a proper fraction b improper fraction c mixed number

d improper fraction

2 a 9 quarters b $2\frac{1}{4} = \frac{9}{4}$

3 a $1\frac{5}{6}$ b 11 sixths c $1\frac{5}{6} = \frac{11}{6}$

4 $2\frac{3}{5}$

5 a $2\frac{1}{2}$ L b $3\frac{1}{4}$ m

6 a $\frac{7}{3}$ b $\frac{7}{5}$ c $\frac{19}{4}$ d $\frac{38}{7}$

7 a 3 whole oranges b 1 quarter c $\frac{13}{4} = 3\frac{1}{4}$

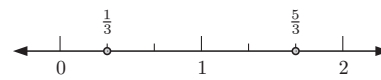
8 a $2\frac{1}{5}$ b $6\frac{1}{2}$ c $5\frac{2}{3}$ d $4\frac{5}{6}$

9 $3\frac{3}{5}$ kg

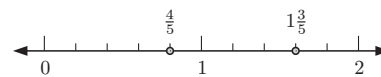
6D

FRACTIONS ON A NUMBER LINE

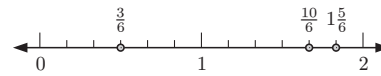
1 a



b



c

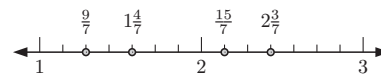


2 a $\frac{5}{6}$

b $\frac{3}{5}, 1\frac{1}{5}$

c $2\frac{2}{3}, 3\frac{2}{3}$

3 a



b

$\frac{9}{7}, 1\frac{4}{7}, \frac{15}{7}, 2\frac{3}{7}$

6E

EQUAL FRACTIONS

1 a $\frac{40}{50}$ b $\frac{4}{5}$ 2 a $\frac{6}{10}$ b $\frac{12}{20}$

3 a $\frac{12}{18}$ b $\frac{3}{4}$ 4 a $\frac{18}{54}$ b $\frac{1}{3}$

5 a $\frac{10}{20}$ b $\frac{8}{20}$ c $\frac{15}{20}$ d $\frac{6}{20}$

6 a $\frac{20}{100}$ b $\frac{75}{100}$ c $\frac{34}{100}$ d $\frac{21}{100}$

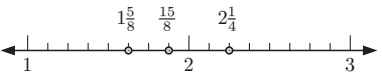
6F

LOWEST TERMS

1 a $\frac{4}{5}$ b $\frac{2}{3}$ c $\frac{6}{5}$ d $\frac{7}{3}$ 2 c

3 a $\frac{1}{6}$ b $\frac{1}{3}$ c $\frac{1}{2}$ d $\frac{2}{3}$ e $\frac{1}{3}$

6G **COMPARING FRACTIONS**

- 1 a $\frac{3}{7} < \frac{5}{7}$ b $\frac{10}{3} < 3\frac{2}{3}$
 2 Ilya ($\frac{1}{4}$ hour more)
 3 a $\frac{1}{4} < \frac{3}{8}$ b $\frac{3}{5} > \frac{5}{10}$ c $\frac{5}{3} > \frac{10}{9}$ d $\frac{14}{15} < \frac{4}{3}$
 4 sleeping ($\frac{1}{12}$ more of his time)
 5 a $\frac{2}{3}$ b $\frac{3}{6}$ c Eve ($\frac{1}{6}$ more)
 6 a 
 b $2\frac{1}{4}, \frac{15}{8}, 1\frac{5}{8}$
 7 a $\frac{16}{7}, \frac{20}{7}, 3\frac{1}{7}$ b $\frac{1}{5}, \frac{2}{5}, \frac{6}{10}$
 8 a $\frac{5}{2}, 1\frac{1}{8}, \frac{3}{4}$ b $\frac{7}{3}, \frac{10}{7}, \frac{27}{21}$

6H **ADDING AND SUBTRACTING FRACTIONS**

- 1 a $\frac{3}{5}$ b $\frac{1}{4}$ c $\frac{11}{8}$ d $\frac{9}{11}$ e $\frac{26}{15}$ f $\frac{13}{16}$
 2 a $\frac{1}{2}$ b $\frac{4}{3} = 1\frac{1}{3}$ 3 a $3\frac{5}{7}$ b $3\frac{3}{10}$ 4 $\frac{5}{8}$ of a bag
 5 a $6\frac{1}{5}$ b $2\frac{1}{2}$ c 4 6 a $\frac{4}{7}$ b $2\frac{3}{10}$
 7 a 4 biscuits b $1\frac{1}{2}$ more biscuits
 8 a $\frac{7}{10}$ b $\frac{1}{9}$ c $\frac{16}{15}$ d $\frac{17}{14}$ e $\frac{23}{24}$ f $\frac{51}{100}$
 9 $6\frac{5}{12}$ 10 a $\frac{1}{4}$ b $\frac{17}{12}$ c $\frac{7}{2} = 3\frac{1}{2}$ 11 $\frac{1}{8}$ of a tub
 12 a $4\frac{3}{8}$ b $1\frac{7}{10}$ 13 $9\frac{3}{4}$ hours 14 $\frac{9}{10}$ L

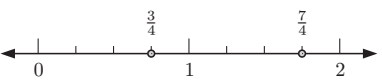
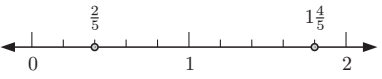
6I **MULTIPLYING A FRACTION BY A WHOLE NUMBER**

- 1 a $\frac{4}{7}$ b $\frac{15}{16}$ 2 a 4 b 20 3 $\frac{10}{9}$
 4 a $\frac{7}{3}$ b $\frac{15}{4}$

6J **A FRACTION OF A QUANTITY**

- 1 a 6 b 9 c 16 d 15
 2 a 8 b 15 c 40 d 105
 3 a 6 houses b \$90 4 3 guests
 5 a \$75 b \$525 6 18 students 7 60 people

REVIEW OF CHAPTER 6

- 1 a $\frac{4}{7}$ b $\frac{7}{10}$ 2 $\frac{5}{12}$ 3 a $\frac{7}{13}$ b $\frac{5}{18}$
 4 a $2\frac{3}{4}$ b $7\frac{2}{5}$ 5 a $\frac{9}{15}$ b $\frac{10}{15}$
 6 a 
 b 
 7 a $\frac{15}{8} < 2\frac{1}{8}$ b $2\frac{1}{4} > \frac{17}{8}$
 8 a $\frac{23}{5}$ b $1\frac{1}{10}$ 9 a $\frac{6}{7}$ b $\frac{10}{3}$
 10 a 6 kg b \$24 11 a $\frac{7}{12}$ b 175 pages

7A **DECIMALS**

- 1 a 18.93 b 50.601 c 44.722
 2 a zero point eight b twelve point two
 c forty nine point five zero three
 3 a 1 and 2 b 7 and 8 c 23 and 24


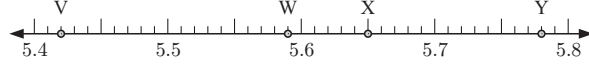
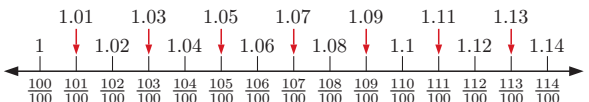
- 4 a 2 b 3 c 2

5

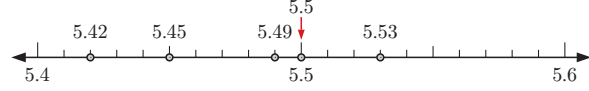
	hundreds	tens	units	decimal point	tenths	hundredths	thousandths	Decimal number
a			3	.	4	0	7	3.407
b		1	4	.	0	6	2	14.062
c		5	0	.	0	3		50.03
d	6	0	1	.	9			601.9
e	1	2	0	.	0	0	5	120.005

- 6 a 4 units or 4 b 4 tenths or $\frac{4}{10}$
 c 4 hundredths or $\frac{4}{100}$ d 4 tens or 40
 e 4 thousandths or $\frac{4}{1000}$
 7 a $7 + \frac{3}{10} + \frac{2}{100}$ b $20 + \frac{1}{10} + \frac{9}{100}$
 c $3 + \frac{5}{10} + \frac{3}{1000}$ d $\frac{5}{10} + \frac{2}{100} + \frac{6}{1000}$
 8 a 0.58 b 0.152 c 3.068 d 10.403
 9 a 0.47 b 0.35 c 1.68 d 2.013
 10 a $\frac{3}{1000}$ b $\frac{27}{1000}$ c $\frac{514}{1000}$

7B **DECIMAL NUMBERS ON A NUMBER LINE**

- 1 a P = 4.7, Q = 4.2 b P = 16.1, Q = 16.7
 c P = 0.24, Q = 0.07 d P = 2.86, Q = 2.97
 2 a 
 b 
 3 

7C **ORDERING DECIMAL NUMBERS**

- 1 a 
 b 5.42, 5.45, 5.49, 5.5, 5.53
 2 a $1.4 > 1.2$ b $2.04 < 2.3$ c $7.50 = 7.5$
 d $8.040 < 8.400$
 3 a 0.25, 0.27, 0.3, 0.31 b 2.015, 2.15, 2.501, 2.51
 4 a 7.42, 7.402, 7.4, 7.04 b 1.110, 1.101, 1.011, 1.010
 5 6.9 km, 6.65 km, 6.6 km, 6.25 km

7D **ROUNDING DECIMAL NUMBERS**

- 1 a 5.3 b 1.7 2 a 3.75 b 8.62
 3 a 8 b 16 4 a 4.2 b 4 c 4.160
 5 a 16.4 kg b 1.81 m

7E **CONVERTING DECIMALS TO FRACTIONS**

- 1 a $\frac{13}{100}$ b $\frac{29}{100}$ c $\frac{57}{1000}$ d $5\frac{83}{100}$
 2 a $\frac{7}{25}$ b $\frac{31}{50}$ c $\frac{21}{200}$ d $2\frac{16}{25}$

7F CONVERTING FRACTIONS TO DECIMALS

- 1 a 0.9 b 0.43 c 0.571 d 1.165
 2 a 0.45 b 0.32 c 0.048 d 2.25 e 0.175 f 6.062
 3 a $\frac{1}{5} = 0.2$, $\frac{2}{5} = 0.4$, $\frac{3}{5} = 0.6$, $\frac{4}{5} = 0.8$
 b $\frac{1}{8} = 0.125$, $\frac{2}{8} = 0.25$, $\frac{3}{8} = 0.375$, $\frac{4}{8} = 0.5$, $\frac{5}{8} = 0.625$,
 $\frac{6}{8} = 0.75$, $\frac{7}{8} = 0.875$
 4 a 0.75 km b 0.36 g c 0.085 kg
 d 3.5 seconds e 2.65 L f 5.8 cm

7G ADDING AND SUBTRACTING DECIMAL NUMBERS

- 1 a 2.1 b 1.16 c 14.03 d 0.722 e 8.43 f 9.275
 2 a 1.11 b 1.6 c 5.03 d 2.16 e 3.17 f 1.03
 3 a 31.9 b 8.777 4 a 21.3 b 6.24
 5 17.07 m 6 \$3.55 more
 7 No, as their combined weight is 201.443 kg which is > 200 kg.

7H MULTIPLYING BY POWERS OF 10

- 1 a 54 b 3.7 2 a 81 b 5231.9
 3 a 4500 b 2781
 4
- | | Number | $\times 10$ | $\times 100$ | $\times 1000$ |
|---|--------|-------------|--------------|---------------|
| a | 0.027 | 0.27 | 2.7 | 27 |
| b | 3.8 | 38 | 380 | 3800 |
| c | 12.34 | 123.4 | 1234 | 12340 |
- 5 a $4.7 \times 10 = 47$ b $0.05 \times 100 = 5$
 6 a \$14 b \$140 c \$1400

7I DIVIDING BY POWERS OF 10

- 1 a 0.18 b 4.913 2 a 0.074 b 2.05
 3 a 0.0135 b 0.68
 4
- | | Number | $\div 10$ | $\div 100$ | $\div 1000$ |
|---|--------|-----------|------------|-------------|
| a | 15 | 1.5 | 0.15 | 0.015 |
| b | 3.18 | 0.318 | 0.0318 | 0.00318 |
| c | 150.4 | 15.04 | 1.504 | 0.1504 |
- 5 a $7.9 \div 10 = 0.79$ b $528.3 \div 1000 = 0.5283$
 6 \$2743.92

7J MULTIPLYING DECIMALS BY A WHOLE NUMBER

- 1 a 2.4 b 0.63 c 0.45 d 0.018
 2 a 3 b 130.2 c 1.52 d 66.35
 3 a 6.8 b 2.17 4 a 49.5 b 40.6
 5 29.6 kg 6 \$137.50

7K DIVIDING DECIMALS BY A WHOLE NUMBER

- 1 a 1.2 b 0.71 c 20.1 d 2.06
 2 a 3.75 b 1.55 c 0.78 d 0.535
 3 \$4.15 4 11.45 cm

REVIEW OF CHAPTER 7

- 1 a 0.17 b 0.043 c 6.905
 2 a $M = 3.39$, $N = 3.33$ b $M = 0.22$, $N = 0.29$
 3 4.201, 4.2, 4.021, 4.012 4 a 7.5 b 7.461
 5 a $\frac{7}{10}$ b $\frac{31}{100}$ c $\frac{13}{200}$ d $\frac{21}{25}$
 6 a 0.17 b 0.52 c 0.075 d 0.084
 7 a 0.85 b 5.08 c 8.59 d 1.82
 8 \$819.99
 9 a 46 b 724.9 c 0.38 d 0.017
 10 a 4.2 b 2.28 c 0.09 d 1.448
 11 15 kg

8A UNITS

- 1 a strawberries b punnets of strawberries
 2 a D b A c E d C e B
 3 The weight of a feather in tonnes is too small a number to be sensible.

8B READING SCALES

- 1 a 16 cm b 26 mm c 64.4 cm
 2 a 1.5 L b 900 mL c 70 mL
 3 a 0.55 kg b 0.25 kg

8C MASS

- 1 a g b kg c tonnes d g
 2 a C b A c B
 3 a 4800 g b 19.5 g 4 a 6200 kg b 1.14 kg
 5 a 0.42 t b 3680 mg c 5.7 kg
 6 2.15 kg 7 9 kg 8 No, they need an extra 100 g of butter.
 9 a 1104 kg b 1396 kg

REVIEW OF CHAPTER 8

- 1 Your height in kilometres is too small a number to be sensible.
 2 a 12 mm b 1.6 kg c 23 mL
 3 a kg b g c tonnes
 4 a 62500 g b 3.4 g c 77.2 g
 5 a 68400 g b 0.0684 t 6 72 kg

9A UNITS OF LENGTH

- 1 a cm b km c mm 2 a cm b mm
 3 a 44 mm b 63 mm
 4 a 9300 m b 475 cm c 8.6 cm d 27.4 m
 5 a 12000 mm b 4.21 m 6 192.5 cm 7 48.5 mm
 8 a 82 cm, 53 cm, 14.6 cm, 9.1 cm
 b 91 mm, 14.6 cm, 530 mm, 0.82 m

9B OPERATIONS WITH LENGTHS

- 1 a $(2000 + 420) \text{ m} = 2420 \text{ m}$
 b $(4000 + 538 + 0.18) \text{ m} = 4538.18 \text{ m}$

- 2 a i** 34 800 m **ii** 34.8 km
b i 348 000 m **ii** 348 km
3 a 160 cm **b** 960 cm **c** 640 cm

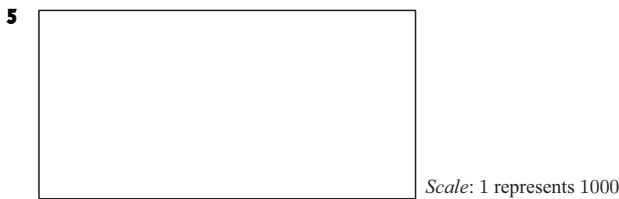
9C PERIMETER

- 1 a** 9 cm **b** 30 km **c** 118 mm **d** 31 m
2 a 24 m **b** 122 cm **3 a** 78 cm **b** 80 m
4 a A: 84 mm, **B:** 78 mm **b A**
5 66 m **6 a** 21.4 m **b** \$2140
7 a 56 m **b** 224 m **8** 57 cm

9D SCALE DIAGRAMS

- 1 a i** 8 m **ii** 30 m **b i** 2 m **ii** 40 cm
2 a 14 m **b** 6 m **c** 6 m by 4 m **d** 3 m by 2 m
3 a 3 km **b i** 6 km **ii** 10.5 km

4 5 cm



6 1 represents 50

REVIEW OF CHAPTER 9

- 1 a** 4.36 m **b** 5.06 m
2 72.8 cm, 980 mm, 150 cm, 3.8 m
3 a 1084 m **b** 1.084 km **4 a** 37 m **b** 40 cm
5 a 72.9 m **b** \$5832 **6** 18.1 cm
7 a 28 m **b** 5 mm **8** 1 represents 30

10A AREA

- 1 a** cm^2 **b** m^2 **c** km^2 **d** mm^2
2 a C **b D** **c B** **d A**
3 10 cm^2
4 a 54 tiles **b** 2.7 m^2 **c** \$126.90
5 a 32 mm^2 **b** 60 mm^2 **c** 36 mm^2

10B THE AREA OF A RECTANGLE

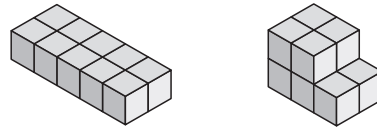
- 1 a** 32 m^2 **b** 21 km^2 **c** 132 cm^2
2 4.5 m^2
3 bathroom: 1650 cm^2 , laundry: 1750 cm^2
 ∴ laundry window is larger.
4 a 75 m^2 **b** 1.5 L
5 a 24 m^2 **b** 3 m^2 **c** 2 m^2 **d** 19 m^2

10C THE AREA OF A TRIANGLE

- 1 a** 14 cm^2 **b** 11 cm^2 **c** 9 cm^2
2 a 3 m^2 **b** \$7.50
3 a i 12 m^2 **ii** 4.5 m^2 **b** 16.5 m^2

10D VOLUME

- 1 a** cm^3 **b** mm^3 **c** m^3
2 a 18 cm^3 **b** 30 cm^3 **c** 25 cm^3
3 Note: Other answers are possible.



10E VOLUME OF A RECTANGULAR PRISM

- 1 a** 90 m^3 **b** 80 cm^3 **c** 147 mm^3
2 480 cm^3 **3** $25\,000 \text{ cm}^3$ **4** 4000 mm^3 **5** 6600 cm^3

10F CAPACITY

- 1 a** mL **b** L **c** mL **d** kL
2 a 15 000 mL **b** 7.3 kL **c** 4600 kL **d** 0.93 L
3 1.5 L

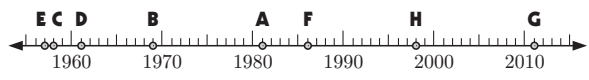
10G CONNECTING VOLUME AND CAPACITY

- 1** 980 mL **2 a** 1.8 L **b** 84 kL
3 a 15 000 mL **b** 15 L

REVIEW OF CHAPTER 10

- 1 B** **2** 9 cm^2
3 a 49 cm^2 **b** 5 cm^2
4 a 27.6 cm^2 **b** 1159.2 cm^2
5 a 16 cm^3 **b** 10 cm^3
6 a 70 cm^3 **b** 1440 m^3
7 a 3700 L **b** 0.095 ML
8 a 3 m^2 **b** 4.5 m^3 **c** 4.5 kL

11A TIME LINES

- 1 a** 2007 **b i** 2009 **ii** 2015 **c** 11 years old
2 a 1915 **b** bionic ear **c** heart pacemaker was invented
3 a
- 
- b E** **c** 5 events **d** 53 years

11B UNITS OF TIME

- 1 a** 480 s **b** 49 days **c** 10 days **2** 4 h
3 a 296 min **b** 449 min
4 a 1518 s **b** 517 s
5 a 154 min **b** 22 students
6 a 1 min 27 s **b** 5 min 42 s
7 a 2 h 20 min **b** 9 h 32 min **8** 2 h 48 min

11C THE CALENDAR YEAR

- 1 a** no **b** no
2 365 days **3** 92 winter days **4** 720 h

- 5 a 36 months b 1096 days c 26 304 h
 6 a 23 days b 82 days
 7 114 days 8 May 9th

11D TIME CALCULATIONS

- 1 a 11:00 pm b 5:24 pm
 2 a 11:42 am b 5:18 am 3 3:45 pm
 4 a 3 h 30 min b 14 h 45 min 5 4 h 25 min


11E 24-HOUR TIME

- 1 a 05:38 b 12:51 c 12:00 d 23:04
 2 a 7:00 am b 3:22 pm c 8:00 pm d 12:05 am
 3 a 60 minutes or more is not possible.
 b 24:00 or more is not possible.
 4 a 05:45 b 21:25
 5 a 10 h 30 min b 07:25

11F TIMETABLES

- 1 a i 5:57 am ii 8:30 pm
 b i 22nd December 2020 ii 14 h 30 min 37 s
 2 a 1:30 pm b Reptiles, Penguins, and Crocodiles
 c 30 minutes d 1 hour
 3 a 5 session times b 3:45 pm c 1 h 20 min d 7:25 pm

REVIEW OF CHAPTER 11

- 1 a i 2010 ii 2015
 b i 2 years ii 14 years
 2 a 540 min b 7200 s 3 2 days 11 h
 4 a i 7:10 pm ii 19:10
 b i 1 h 50 min ii 3 h 35 min
 c i 6 h 45 min ii 1 day 30 min
 d 2 days 18 h 15 min
 5 1 h 53 min 6 3 h 30 min 7 70 days
 8 a 9:45 am b 10:01 pm
 9 a 12:15 pm b 5 presentations c 4 h 50 min
 10 a 
 b B c 4 events d 1990

12A PERCENTAGE

- 1 a i $\frac{36}{100}$ ii 36% b i $\frac{50}{100}$ ii 50%
 2 a 90% b 45%
 3 a i 13 ii 27 iii 29 iv 31
 b i $\frac{13}{100}$ ii $\frac{27}{100}$ iii $\frac{29}{100}$ iv $\frac{31}{100}$
 c i 13% ii 27% iii 29% iv 31%
 d 100%; this represents all the chocolate balls in the bowl.
 4 a Project 3 b Project 1 c Project 2
 5 a i 8% ii 18% b family
 c 100%; this represents all the DVDs on display.

12B CONVERTING PERCENTAGES INTO FRACTIONS

- 1 a $\frac{23}{100}$ b $\frac{17}{100}$
 2 a $\frac{1}{5}$ b $\frac{7}{10}$ c $\frac{9}{50}$ d $\frac{6}{25}$

12C CONVERTING FRACTIONS INTO PERCENTAGES

- 1 a 19% b 46%
 2 a 40% b 25% c 74% d 64%
 3 a 45.8% b 9.3%
 4 a $\frac{3}{1} = 3$ b 300%

Letter characteristic	Number	Fraction	Fraction with denominator 100	Percentage
vowel	3	$\frac{3}{10}$	$\frac{30}{100}$	30%
round edges only	1	$\frac{1}{10}$	$\frac{10}{100}$	10%
straight edges only	5	$\frac{5}{10}$	$\frac{50}{100}$	50%
consonant	7	$\frac{7}{10}$	$\frac{70}{100}$	70%

- 6 $\frac{1}{5}$ is 20%, $\frac{1}{10}$ is 10%, $\frac{1}{20}$ is 5%

12D CONVERTING PERCENTAGES INTO DECIMALS

- 1 a 0.84 b 0.45 c 0.17 d 0.3
 2 a 0.145 b 0.538 c 0.063 d 0.0215
 3 a 0.34 b $\frac{17}{50}$

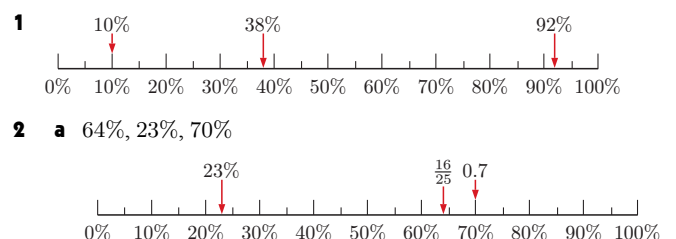
12E CONVERTING DECIMALS INTO PERCENTAGES

- 1 a 48% b 22% c 95% d 7%
 2 a 80% b 30% c 5.6% d 12.8%

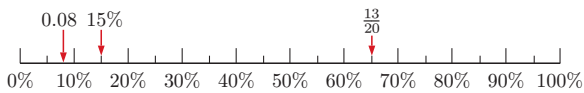
3

	Percent	Fraction	Decimal
a	25%	$\frac{1}{4}$	0.25
b	30%	$\frac{3}{10}$	0.3
c	90%	$\frac{9}{10}$	0.9
d	64%	$\frac{16}{25}$	0.64

12F NUMBER LINES

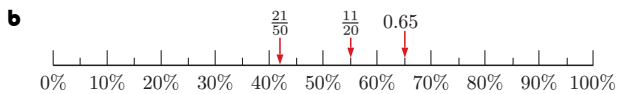


b 15%, 65%, 8%



3 a 30%, 0.3, $\frac{30}{100}$ b 55%, 0.55, $\frac{55}{100}$ c 80%, 0.8, $\frac{80}{100}$

4 a i 42% ii 65% iii 55%



c $\frac{21}{50}$, $\frac{11}{20}$, 0.65

12G EXPRESSING ONE QUANTITY AS A PERCENTAGE OF ANOTHER

- 1 a 70% b 86%
- 2 a 32% b 21% c 80%
- 3 a 60% b 8% c 13% d 15%
- 4 9%
- 5 a i 40% ii 36% iii 16%
- b 92%; 8% of the organisation, or 4 members, did not vote.
- 6 a 97% b no

12H FINDING A PERCENTAGE OF A QUANTITY

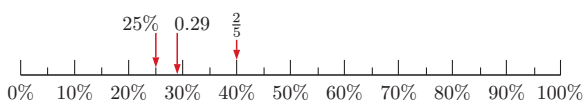
- 1 a 1.98 m b 61.2 g
- 2 a 240 cents b 120 cm c 84 minutes
- 3 57 pavers
- 4 a 60% b i 240 m² ii 360 m²
- 5 1120 spectators

12I DISCOUNT

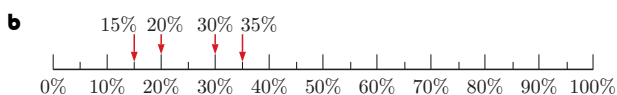
- 1 a \$32 b \$128
- 2 a \$520 b \$156
- c Yes; the actual selling price is \$364, which is less than the amount Justine has available.
- 3 a \$23.60 b \$1088

REVIEW OF CHAPTER 12

- 1 a $\frac{48}{100}$ b 48%
- 2 a 100% b 16% c $\frac{7}{50}$ 3 58%
- 4 a $\frac{3}{10}$ b $\frac{19}{25}$ 5 a \$70 b 4800 m
- 6 85% 7 43.7%
- 8 a 0.22 b 0.346 9 60%
- 10 40%, 25%, 29%



11 a i 64 trees ii 144 trees



c Galas, Golden Delicious, Jonathons, Granny Smiths

12 \$14.85

13A THE NUMBER LINE

- 1 a positive b negative c positive d negative
- 2 a -8 b +5 c -9 d +12
- 3 A = -4, B = 3, C = 1, D = -2
- 4

-10 -5 0 5 10
- 5 a 11°C b -7°C

13B ORDERING NUMBERS

- 1 a $3 > 2$ b $-4 < -1$
- 2

-5 -3 -2 0 3 6 10
- 5, -3, -2, 0, 3, 6
- 3

-10 -5 0 5 10
- 6, 5, 1, -4, -8, -9

13C WORDS INDICATING POSITIVE AND NEGATIVE

- 1 a +10 b -18
- 2 a +8 b -5 c -21
- 3 a -9 b +15
- 4 a

-15 -10 -5 0 5
- b Perisher Valley, NSW and Cunderdin, WA
- c i Frankston, VIC ii Perisher Valley, NSW
- 5 a 15 minutes early b going down 3 floors

	Statement	Number	Opposite of statement	Opposite number
a	2 m below ground level	-2	2 m above ground level	+2
b	winning \$100	+100	losing \$100	-100
c	an increase of 5°C	+5	a decrease of 5°C	-5

13D ADDITION AND SUBTRACTION WITH NEGATIVE NUMBERS

- 1 a -3 b 1 c -1 d -5
- 2 a -3 b -1
- 3 1 floor below ground level 4 5 m below sea level
- 5 a 2 km north b 3 km north
- 6 a decreases by 6 cents per litre b increases by 7 cents per litre

13E ADDING AND SUBTRACTING NEGATIVE NUMBERS

- 1 a 3 b -13 c 2 d -5
- 2 a -1 b 0
- 3 a 10 b 8 c 5 d 11
- 4 a i 50 points ii 45 points iii 0 points
- b Girls: 50 points, Boys: 55 points

- 5 a bird: +3, fly: +2, cat: 0, worm: -2
 b i 2 m ii 5 m
 6 a 3 children b 3 children c Corinne's guess
 d i 11 m ii 13 m e i 25 m ii 10 m

13F MULTIPLYING NEGATIVE NUMBERS

- 1 a -28 b -72 c 22 d -20
 2 decreased by 8°C
 3 a 99 points b -22 points c 11 points
 4 -1×24 , 1×-24 , -2×12 , 2×-12 , -3×8 , 3×-8 ,
 -4×6 , 4×-6

13G DIVIDING NEGATIVE NUMBERS

- 1 a -11 b -6 c 8 d -12
 2 \$60 per chair

REVIEW OF CHAPTER 13

- 1 a positive b neither c negative d negative
 2 $A = -2$, $B = -7$, $C = 7$
 3 a $-6 < 2$ b $-7 > -9$
 4 a travelling 11 km south b losing \$50
 5 a -5 b 1 c 8 floors up
 7 a -4 b 8 c -7
 8 a -24 b -8 c 18 d 72
 9 a -2 b 9 c -2 d -9

14A GENERATING A SEQUENCE

- 1 a $5 \xrightarrow{+3} 8 \xrightarrow{+3} 11 \xrightarrow{+3} 14 \xrightarrow{+3} 17$
 b $27 \xrightarrow{-4} 23 \xrightarrow{-4} 19 \xrightarrow{-4} 15 \xrightarrow{-4} 11$
 c $3 \xrightarrow{\times 10} 30 \xrightarrow{\times 10} 300 \xrightarrow{\times 10} 3000 \xrightarrow{\times 10} 30000$
 2 a 6, 10, 14, 18, 22, 26 b 38, 33, 28, 23, 18, 13
 c 5, -2, -9, -16, -23, -30
 3 a 2, 6, 18, 54 b 500, 100, 20, 4
 4 a 2 cm, 4 cm, 8 cm, 16 cm, 32 cm b 62 cm
 5 a $3, 3\frac{1}{2}, 4, 4\frac{1}{2}, 5, 5\frac{1}{2}$ b $7\frac{2}{5}, 7, 6\frac{3}{5}, 6\frac{1}{5}, 5\frac{4}{5}, 5\frac{2}{5}$
 6 6 cups, $5\frac{1}{3}$ cups, $4\frac{2}{3}$ cups, 4 cups, $3\frac{1}{3}$ cups, $2\frac{2}{3}$ cups, 2 cups
 7 a 5.5, 5.8, 6.1, 6.4, 6.7, 7 b 19, 17.8, 16.6, 15.4, 14.2, 13
 c 640, 64, 6.4, 0.64, 0.064, 0.0064
 8 \$2.20, \$2.35, \$2.50, \$2.65, \$2.80

14B FINDING A RULE FOR A SEQUENCE

- 1 a Start at 12 and add 7 each time.
 b Start at 54 and subtract 5 each time.
 c Start at 6 and multiply by 2 each time.
 d Start at 324 and divide by 3 each time.
 2 a Start at 3 and add 4 each time; 23, 27, 31
 b Start at 39 and subtract 6 each time; 9, 3, -3

- c Start at 640 and divide by 2 each time; 20, 10, 5
 d Start at -22 and add 3 each time; -7, -4, -1
 3 a $\triangle = 33$ b $\triangle = 39$ c $\triangle = 80$ d $\triangle = 48$
 4 a Start at 3 min and increase by 2 min each week.
 b 13 min slow
 5 a Start at 8.3 and increase by 0.8 each time; 12.3, 13.1, 13.9
 b Start at 20.5 and decrease by 0.4 each time; 18.5, 18.1, 17.7
 c Start at 4280 and divide by 10 each time; 0.428, 0.0428, 0.00428
 6 a $\triangle = 7.8$ b $\triangle = 10.01$ c $\triangle = 3.92$
 7 a Start at 2.6 km and increase by 0.7 km each day.
 b i 6.1 km ii on the 9th day
 8 a Start at $\frac{4}{5}$ and add $\frac{3}{5}$ each time; $3\frac{1}{5}, 3\frac{4}{5}, 4\frac{2}{5}$
 b Start at $\frac{1}{3}$ and add $\frac{5}{6}$ each time; $3\frac{2}{3}, 4\frac{1}{2}, 5\frac{1}{3}$
 9 a $\triangle = 5$ b $\triangle = 6\frac{4}{5}$
 10 a Start at $2\frac{1}{2}$ kg and increase by $1\frac{1}{2}$ kg each batch.
 b $11\frac{1}{2}$ kg
 11 a $\frac{7}{17}, \frac{8}{20}, \frac{9}{23}$ b $\frac{13}{21}, \frac{15}{24}, \frac{17}{27}$

14C PATTERNS

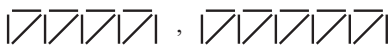
- 1 a 
 b

Diagram number	1	2	3	4	5
Number of matches	4	7	10	13	16


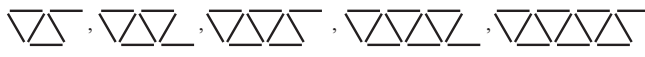
 c The number of matches starts at 4, and increases by 3 each time.
 2 a 
 b

Diagram number	1	2	3	4	5
Number of dots	7	9	11	13	15

 c The number of dots starts at 7, and increases by 2 each time.
 3 Note: Other answers are possible.

 4 The number of pentagons starts at 3, and increases by 2 each time.

REVIEW OF CHAPTER 14

- 1 a $4 \xrightarrow{-5} -1 \xrightarrow{-5} -6 \xrightarrow{-5} -11 \xrightarrow{-5} -16$
 b $2 \xrightarrow{\times 5} 10 \xrightarrow{\times 5} 50 \xrightarrow{\times 5} 250 \xrightarrow{\times 5} 1250$
 2 a 7, 11, 15, 19, 23, 27 b 90, 82, 74, 66, 58, 50
 3 9.1 kg, 10.3 kg, 11.5 kg, 12.7 kg, 13.9 kg
 4 a Start at 11 and add 6 each time.
 b Start at 63 and subtract 5 each time.
 5 a $\triangle = 40$ b $\triangle = 16.1$ c $\triangle = 0.79$
 6 a Start at 7.8 and increase by 0.4 each time; 9.4, 9.8, 10.2
 b Start at 7930 and divide by 10 each time; 0.793, 0.0793, 0.00793
 7 a Start at 3 teaspoons and decrease by $\frac{1}{2}$ teaspoon each week.
 b in the 7th week

8 $\frac{10}{19}, \frac{12}{22}, \frac{14}{25}$



b

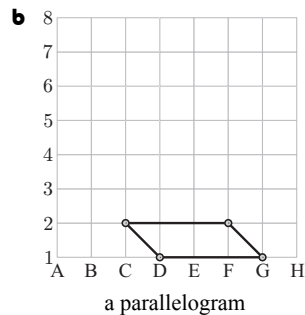
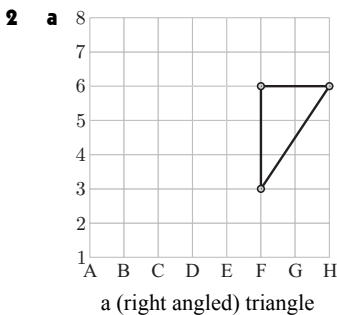
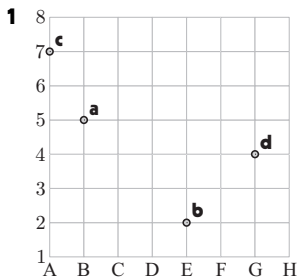
Diagram number	1	2	3	4	5
Number of matches	4	7	10	13	16

c The number of matches starts at 4, and increases by 3 each time.

15A GRID REFERENCES

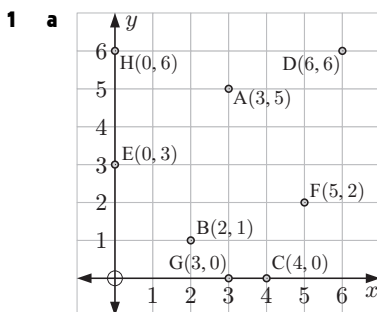
- 1 a i Queensland Museum ii Queens Plaza
 b i H1 ii D5
 c A1, A2, A3, B2, B3, B4, C3, C4, D3, D4, E1, E2, E3, F1, F2, G1
- 2 a i Canunda National Park ii Little Desert National Park
 b i E3 ii B3 iii G6 iv F2
- 3 a Food Court b D4 c C5
 d i 2 lifts ii C1

15B FINDING POINTS



- 3 a i F4 ii C5 b i jaguar ii cheetah
- 4 a i Paula ii Max b i C5 ii F6
 c Dean, D2

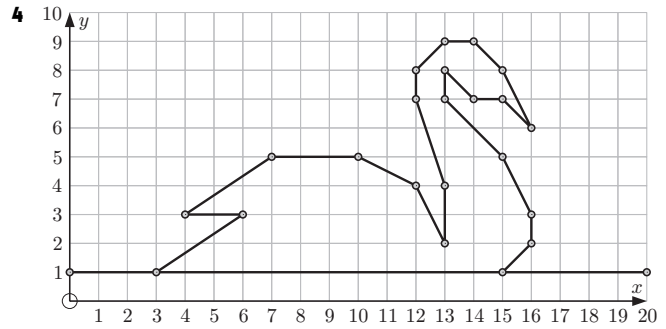
15C COORDINATES



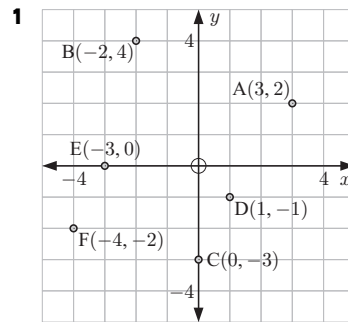
- b i C and G ii The y-coordinate is zero.
 c i E and H ii The x-coordinate is zero.

- 2 a 4 b 5 c i T(4, 4) ii U(2, 3)

3 ALWAYS TRY YOUR BEST

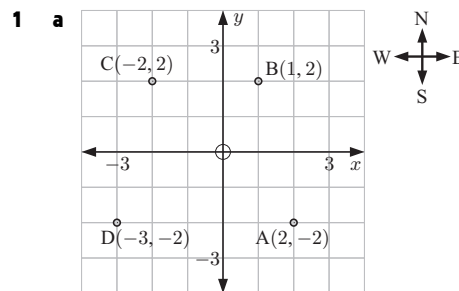


15D POSITIVE AND NEGATIVE COORDINATES



- 2 a i 2 ii -2 iii K(-3, 2)
 b i M ii G
- 3 a i (-3, -2) ii (-3, 2)
 b gerberas c phlox
- 4 a 60 km b 30 km
- 5 a (2, -2) b 600 m
 c i 1200 m (or 1.2 km) ii 1400 m (or 1.4 km)
- 6 a (-4, 2) b i 150 m ii right
 c 2700 m (or 2.7 km)

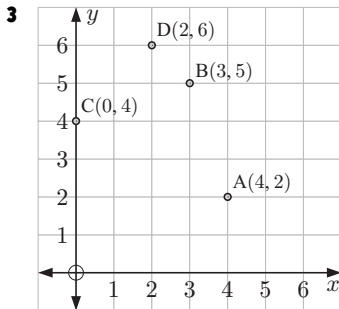
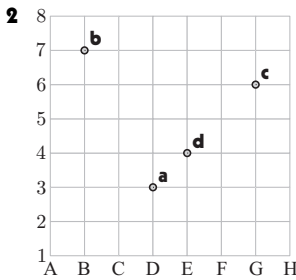
15E COMPASS POINTS



- b i west ii southeast
- 2 a S(-4, -2), T(3, 4) b D c B
- 3 a 25 m b i (2, 2) ii (3, 4)
 c northeast d (-5, 3)
- 4 a Green Team: (-6, 1), Red Team: (-4, 1), Yellow Team: (-5, 1)
 b Yellow Team
 c Green Team must travel 20 m east.
 Red Team must travel 20 m west.

REVIEW OF CHAPTER 15

- 1 a i Shepherds Hill Reserve ii Queens Wharf
b i B4 ii E3



- 3
4 a P(-3, 4) b B
5 a i (1, 4) ii (5, 6)
b i chickens ii lambs c 25 m
6 a i B(-1, -1) ii D(1, -4)
b i east ii north iii southwest
7 a (-5, -4)
b i east ii south iii southwest
c (1, 4)

16A DESCRIBING PROBABILITY

- 1 a 50-50 chance b highly unlikely c highly likely
2 a highly unlikely b impossible
3 a highly likely b highly unlikely c certain
4 B
5 a 4 yellow discs b 4 red discs
c 2 red discs and 2 yellow discs
d 1 red disc and 3 yellow discs, or 4 yellow discs

16B USING NUMBERS TO DESCRIBE PROBABILITIES

- 1 a C b A c B
2 a B b A c C
3 a i Friday ii Monday b Wednesday
c i true ii false
4 a Ryan: 75%, Eric: 89%, Gary: 78%
b likely c Eric

16C OUTCOMES

- 1 a 1, 2, 3, and 4 b 4 outcomes
2 a M, A, T, H, and S b 5 outcomes c 1 outcome

- 3 a November 2nd, 9th, 16th, 23rd, and 30th b 3 outcomes
4 a 12 outcomes b 3 outcomes

16D CALCULATING PROBABILITIES

- 1 a 1, 2, 3, 4, 5, and 6 b 6 outcomes
c i $\frac{1}{6}$ ii $\frac{1}{6}$ iii $\frac{3}{6} = \frac{1}{2}$
2 a 50 outcomes
b i $\frac{1}{50}$ ii $\frac{2}{50} = \frac{1}{25}$ iii $\frac{10}{50} = \frac{1}{5}$
3 a $\frac{2}{8} = \frac{1}{4}$ b $\frac{5}{8}$
4 a $\frac{2}{9}$ b $\frac{7}{9}$
5 a i $\frac{15}{20} = \frac{3}{4}$ ii 75% iii 0.75
b likely
6 a i $\frac{5}{12}$ ii $\frac{3}{12} = \frac{1}{4}$
b white egg

16E COMPLEMENTARY EVENTS

- 1 a The sun will not rise tomorrow.
b A family has at least 2 children.
2 a $\frac{2}{7}$ b $\frac{5}{7}$
3 a 1 is neither prime nor composite, so exactly one of A or B is not certain to occur.
b A number which is not prime is drawn.
4 $\frac{21}{25}$ 5 0.33

REVIEW OF CHAPTER 16

- 1 a highly unlikely b certain
2 a 3 green cards b 3 white cards
c 1 green card, 1 yellow card, and 1 white card
3 a A, B, C, D, and E b 5 outcomes c yes
4 a $\frac{1}{25}$ b $\frac{16}{25}$
5 a highly likely b impossible c slightly less than 50-50 chance
6 a Jessie
b Sum is 1. It is certain that either Jessie or Henry will win the game.
7 a $\frac{1}{30}$ b $\frac{5}{30} = \frac{1}{6}$ c $\frac{22}{30} = \frac{11}{15}$
8 a $\frac{7}{15}$ b $\frac{8}{15}$
9 a Penny will not have a sandwich for lunch.
b The cat will not sleep on the rug.
10 $\frac{4}{13}$

17A CATEGORICAL DATA

Sport	Tally	Frequency
Cricket (C)		6
Football (F)		7
Gymnastics (G)		4
Netball (N)		8
Total		25

- b 6 students
c The mode is netball. This was the most popular sport.

2 a

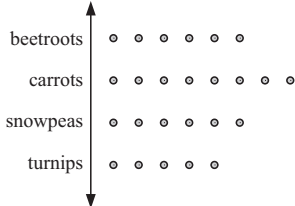
Rating	Tally	Frequency
Delicious (D)		7
Nice (N)		10
Tasteless (T)		8
Awful (A)		5
<i>Total</i>		30

b nice **c** no

17B DOT PLOTS

1 a 5 students **b** 23 students **c** bin duty **d** $\frac{5}{23}$

2 a Vegetables to grow in garden

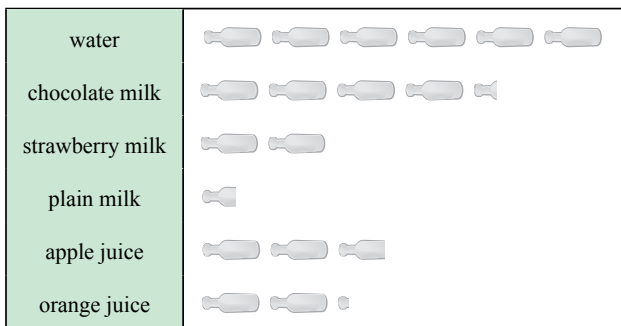


b carrots **c** i 25 students ii 6 students **d** 24%

17C PICTOGRAPHS

1 a i 5 pieces ii 15 pieces
b yes (30 chairs, 27 other pieces of furniture)

2 Drinks sold

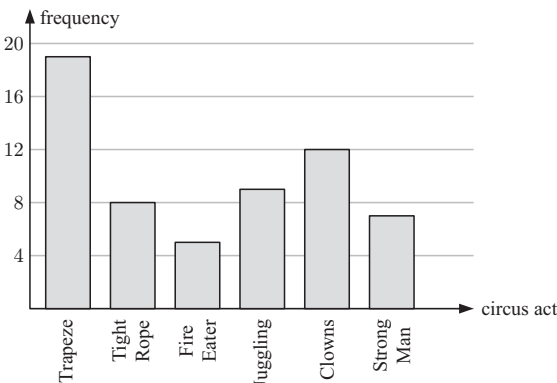


17D COLUMN GRAPHS

1 a 32 Duchess pear trees **b** Packham **c** $\frac{2}{11}$

2 a 60 people

b Favourite circus act



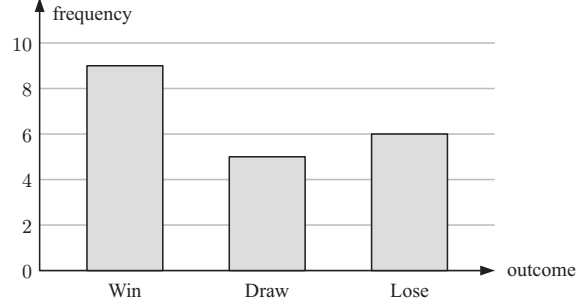
c trapeze **d** 7 more people

3 a 20 matches

b

Outcome	Tally	Frequency
Win (W)		9
Draw (D)		5
Lose (L)		6
<i>Total</i>		20

c Soccer team match results



d win **e** 25%

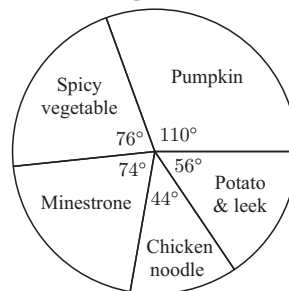
17E PIE CHARTS

1 a self-contained **b** false **c** 15 couples

2 a 2°

b Pumpkin: 110°, Potato & leek: 56°, Chicken noodle: 44°, Minestrone: 74°, Spicy vegetable: 76°

c Soup chosen



d pumpkin

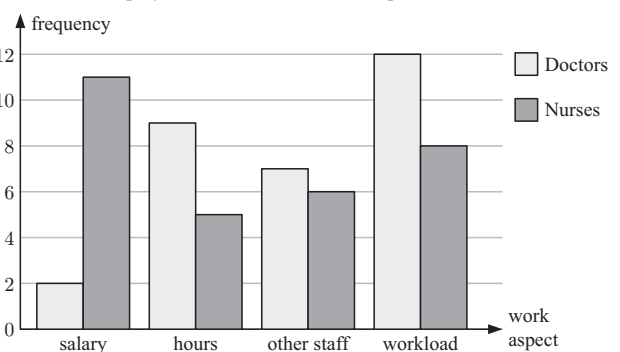
17F COMPARING CATEGORICAL DATA

1 a 12 boys **b** 17 girls

c i Emma Binder ii Emma Binder

d i girls ii boys

2 a Employment dissatisfaction at hospital

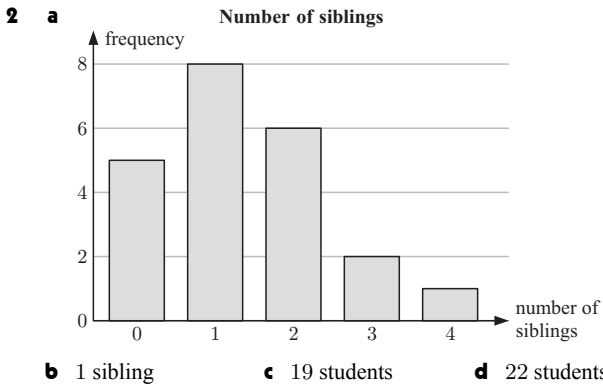


b i workload ii salary

c doctors

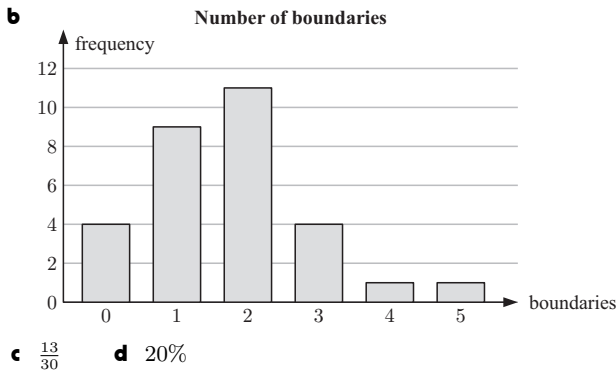
17G NUMERICAL DATA

1 a 15 children **b** 3 serves of vegetables



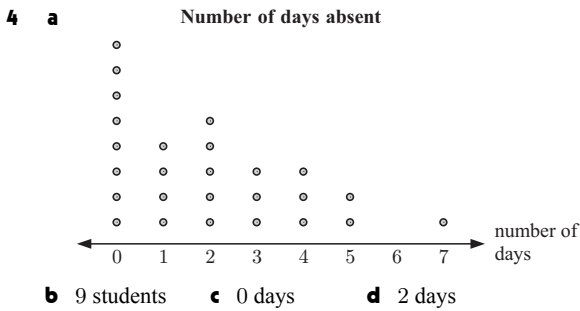
3 a

Boundaries in an over	Tally	Frequency
0		4
1		9
2		11
3		4
4		1
5		1
Total		30



17H MEASURING THE CENTRE OF A DATA SET

- 1 a** 6 **b** 5 **2** 22 cm **3** 8 times



REVIEW OF CHAPTER 17

1 a

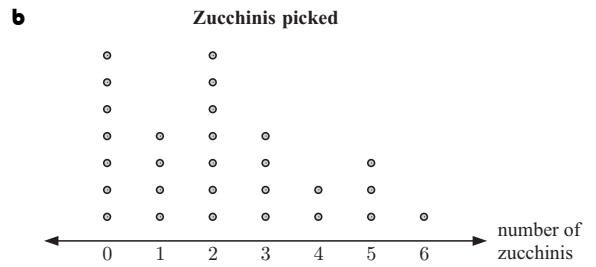
Person	Tally	Frequency
Mother (M)		10
Sister (S)		3
Aunty (A)		2
Father (F)		4
Best friend (B)		6
Total		25

- b** 4 times **c** her mother
- 2 a** 2 fish caught **b** i Ken ii Sam **c** 7 fish
- 3 a** 25 students **b** 8 hours **c** 20 students **d** 8%

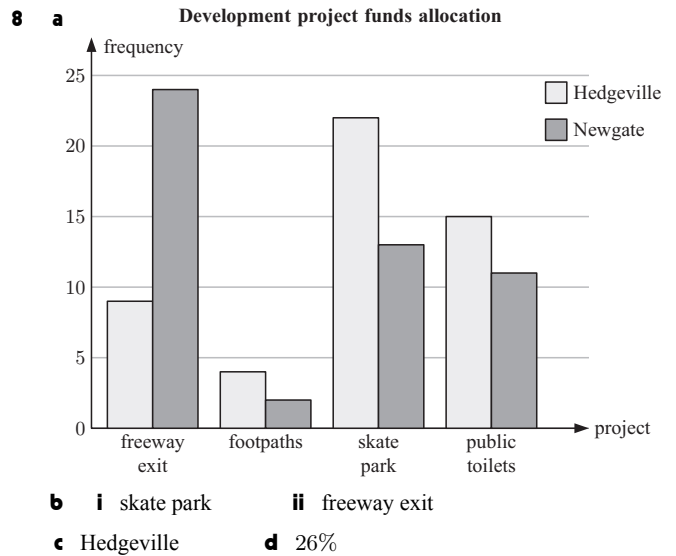
- 4** 6 minutes **5 a** 4 shots **b** 3 players

6 a

Number of zucchinis	Tally	Frequency
0		7
1		4
2		7
3		4
4		2
5		3
6		1
Total		28

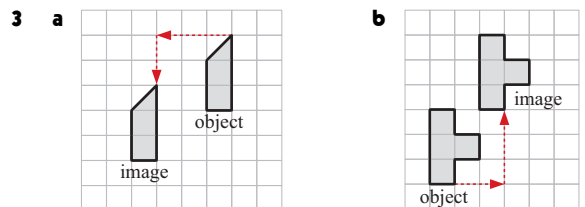


- c** 6 days **d** $\frac{1}{4}$
- 7 a** 22% **b** wool **c** true



18A TRANSLATIONS

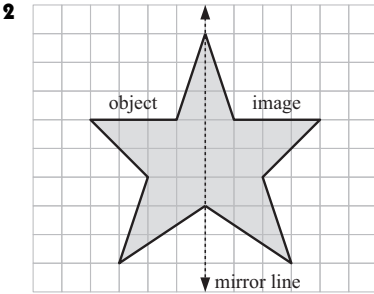
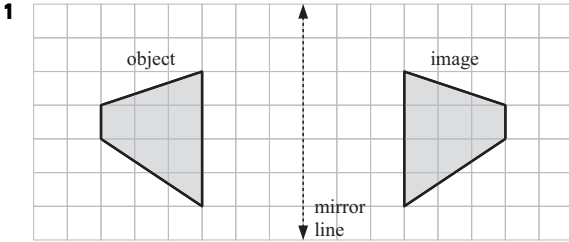
- 1 a** 4 units up **b** 3 units right and 2 units down
- 2 a** 3 units left and 2 units down **b** 2 units right and 5 units up
- c** 1 unit right and 3 units down



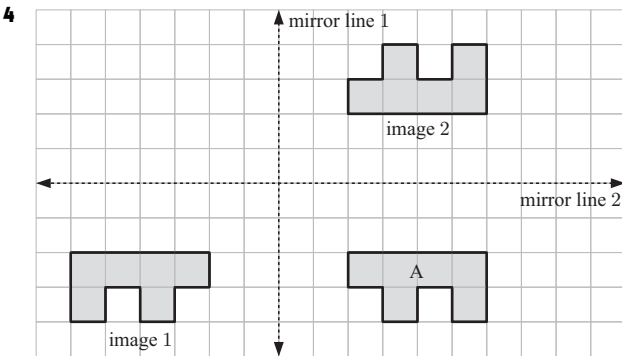
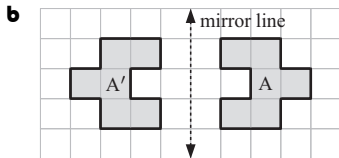
- 4 a**
-
- b** 4 units right and 3 units down
- 5 a** C **b** 1 unit right and 4 units down

18B

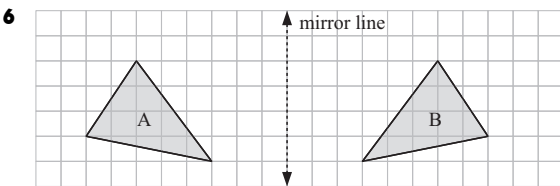
REFLECTIONS



3 a Not every point of B is the same distance from the mirror line as the points of A.



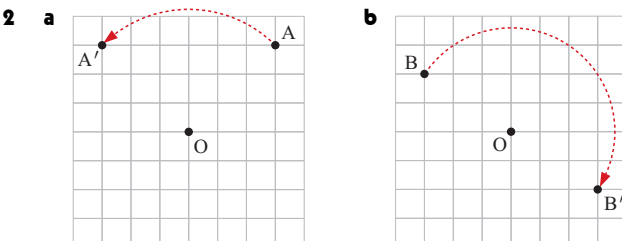
5 C and E, mirror line 3



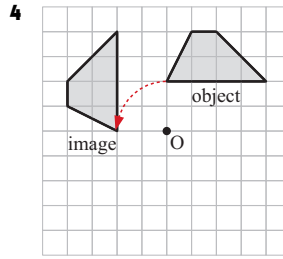
18C

ROTATIONS

1 a 90° clockwise b 90° anticlockwise
c 180° clockwise or 180° anticlockwise



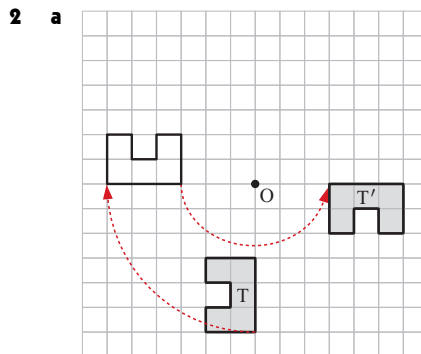
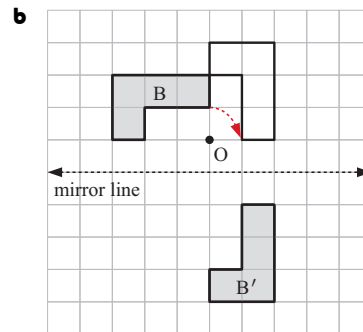
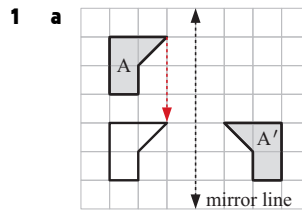
3 a 90° clockwise b 180° clockwise or 180° anticlockwise
c 90° anticlockwise



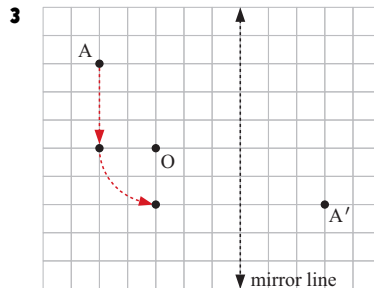
5 C

18D

COMBINATIONS OF TRANSFORMATIONS



b Rotate T 90° anticlockwise about O.

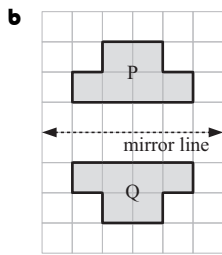


4 Translate A 2 units right and 2 units up, then rotate 90° clockwise about O.

5 Reflect A in mirror line 1, then rotate 90° anticlockwise about O, then reflect in mirror line 2.

REVIEW OF CHAPTER 18

1 a 3 units right and 3 units down b 3 units right and 4 units up
2 a Not every point of Q is the same distance from the mirror line as the points of P.



- 3 a** 90° clockwise **b** 90° anticlockwise
c 180° clockwise or 180° anticlockwise

