Assessment Test 1

Section A
Pages 47-50

1. 25.5 cm

There are 10 spaces between 24 cm and 26 cm. So each space is worth $2 \div 10 = 0.2$ cm. The arrow is pointing halfway between 25.4 and 25.6. Half of the gap between 25.4 and 25.6 is $0.2 \div 2 = 0.1$ cm, so the number the arrow is pointing to is $25.4 + 0.1 = 25.5$ cm

2. C

Angle y is bigger than a right angle (90°), so it can't be 60° (B) or 90° (D). It is smaller than a straight line (180°), so it can't be 180° (A). 175° (E) is almost a straight line and angle y is smaller than a straight line by more than 5°. So that leaves C as the only possible answer.

3. A

You need to use BODMAS to work out the initial answer and each option.
$6 \times 2 + 12 = 12 + 12 = 24$
A: $8 \times 3 = 24$, $48 - 24 = 24$ — so A is the answer.
B: $11 \times 2 = 22$, $3 + 22 = 25$
C: $3 \times 7 = 21$
D: $24 \div 2 = 12$, $12 - 1 = 11$
E: $4 \times 4 = 16$, $2 + 16 = 18$

4. £7.08

£5 + £2 = £7
5p + 2p + 1p = 8p
£7 + 8p = £7.08

5. D

Scalene triangles have three different sides and three different angles. Rhombuses, kites, regular pentagons and isosceles triangles have at least two equal sides and at least two equal angles.

6. £8.91

Round each 99p up to £1 by adding 1p, then multiply by 9: £1 x 9 = £9.
You added 9 x 1p to the total cost, so subtract the extra 9p: £9 – 9p = £8.91

7. B

In 45.952, 9 is in the tenths column.
Look at the number in the next column to the right (the hundredths). It is 5, so round the 9 tenths up to 10 tenths. 10 tenths is one unit, so the rounded number is 46.0

8. 16:50

When using the 24 hour clock, the hours in the afternoon, i.e. after 12 noon, increase from 13 to 23. Ten to five in the afternoon is equivalent to fifty minutes past four. Four o'clock is 4 hours after 12 noon so is 4 + 12 = 16:00. To make this fifty minutes past four, 16:00 + 0:50 = 16:50

9. A

The cake is cut into 20 slices and 16 are given away.
This leaves 20 – 16 = 4 slices.
As a fraction of the overall cake, this is $^4/_{20}$.
The highest common factor of both the numerator and the denominator is 4: $4 \div 4 = 1$, $20 \div 4 = 5$.
The amount of cake left over is $^1/_5$.

10. 1900

The tens column is the second column from the right. This is 9, which rounds up to 10.
This increases the value of the hundreds column by one making the answer 1900.

11. B

The customer is charged £50 for the job, plus the number of hours (h) multiplied by £25.
So the cost = $50 + 25 \times h$, or $50 + 25h$.

12. 5

Work through your 5 times table until you come to first number greater than 24.
5 x 5 = 25, so 5 tents would be enough.

13. 1404

There are 3 lots of 2808 (multiplication is repeated addition), which is equal to 6 lots of something.
6 is double 3, so halve 2808 to find the missing number: Half of 2808 is 1404.
So $2808 + 2808 + 2808 = 1404 \times 6$

14. C

On the graph, you can see that the February sales are lowest. The only game for which this is true is Croc Chase.

15. 9

The whole circle represents 36 children. The yellow area of the pie chart is 90° or a quarter of the circle. $^1/_4$ of 36 is $36 \div 4 = 9$.
9 children wore yellow hats.

16. £1.07

One way of doing £10 – £8.93 is to count up from 8.93 to 10 on a quick sketch of a number line:

0.07 + 1 = £1.07

17. 61

You can't calculate the blue team total straight away. One method is to calculate the number of points won by the Year 5 blue team first (90 – 27 – 32 = 31). Then use this to find the blue team total (31 + 30 = 61).

Team	Year 5	Year 6	Total
Red	27	50	77
Yellow	32	25	57
Blue	31	30	61
Total	90	105	

Alternatively, find the grand total by adding the numbers on the bottom row (90 + 105 = 195). Then use this to find the blue team total: (195 – 77 – 57 = 61).

18. 6p

10% of 40p is 40 ÷ 10 = 4p. So the cost of each packet is 40 – 4 = 36p.
There are 6 bears in each packet, so the cost of each bear is 36 ÷ 6 = 6p.

19. D

The spinner can be split into 10 equal sections. 2 of the 10 sections are white and 6 of the 10 sections are spotty. So for every 2 white sections there are 6 spotty sections. This can be simplified so for every one white segment there are three spotty segments.

20. D

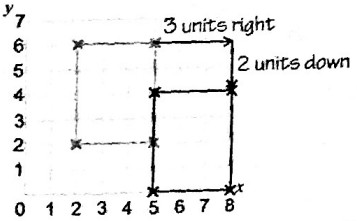
The right angled triangle has 1 right angle, the square has 4 right angles. None of the other shapes have any.

21. D

Prime numbers are only divisible by themselves and 1.
47 = 1 × 47
55 = 1 × 55 and 5 × 11
42 = 1 × 42, 2 × 21, 3 × 14 and 6 × 7
41 = 1 × 41
58 = 1 × 58 and 2 × 29
63 = 1 × 63, 3 × 21 and 7 × 9
62 = 1 × 62 and 2 × 31
73 = 1 × 73

22. D

Look at the top right corner of the rectangle, and follow the instructions to see where it moves to.



The top right corner would now be at point (8, 4). This coordinate is only in option D, so that's the answer.

23. 6

Add up the shoe sizes: 6 + 6 + 7 + 5 + 7 + 6 + 5 = 42. There are 7 numbers so divide by 7 to find the mean: 42 ÷ 7 = 6.

24. 28 cm

The length of each side of the hexagons is 2 cm. The outer edge of the shape is made up of 14 of these sides. So the total length = 2 × 14 = 28 cm

25. 36.6 g

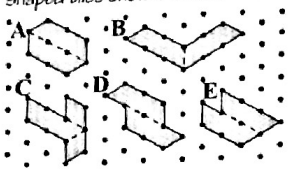
¼ tin has 12.2 g of carbohydrate.
¾ is 3 times as much as ¼.
so 12.2 g × 3 = 36.6 g of carbohydrate.

26. 10:05

The first train after 9 am from Chapel Street is at 9:15. Reading down the same column of the table, it arrives in Lanston at 10:05.

27. C

A, B, D and E can be split into two of the trapezium-shaped tiles shown. C can't — the tiles overlap.



28. A

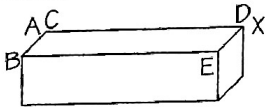
The only days on which there is a meat pie and a non-apple dessert are Monday and Friday.
This is two days out of five, so the fraction is ⅖.

29. –8 °C

The temperature drops from 1 °C to –2 °C, which is a drop of 3 °C, from Tuesday to Wednesday.
Twice this is 3 °C × 2 = 6 °C.
6 °C lower than –2 °C is –8 °C.

30. D

Imagine folding the net up to make a cuboid.
Corner D will touch X.



Section B
Pages 50-52

1. 0.9 kg

First calculate the mass of the 7 peaches:
7 × 200 g = 1400 g. 1 kg = 1000 g, so 1400 g = 1.4 kg
The mass of the basket: 2.3 – 1.4 = 0.9 kg

2. 2.15 kg

In question 1, the basket was found to weigh 0.9 kg.
3 peaches are exchanged for apples.
The basket will still contain 7 – 3 = 4 peaches.
Each peach weighs 200 g. The weight of peaches in the basket is 200 × 4 = 800g. This is equal to 800 ÷ 1000 = 0.8 kg.
One apple weighs ¾ of the weight of one peach.
(200 ÷ 4) × 3 = 150 g. The weight of 3 apples is 150 × 3 = 450 g. This is equal to 0.45 kg.
The weight of the basket and its contents is 0.9 + 0.8 + 0.45 = 2.15 kg

3. 0.45 m

The furthest Andy jumped was 5.25 m.
His shortest jump was 4.80 m.
The difference is 5.25 – 4.80 = 0.45 m

4. 4.75 m

The only distance that Roger jumped more than once was 4.75 m.

5. 5.00 m

The mean is found by adding all the values and dividing the sum by the number of pieces of data.
5.25 + 5.00 + 4.90 + 4.95 + 4.80 + 5.10 = 30.00
So the mean is 30.00 ÷ 6 = 5.00 m.

6. 0.05 m

Roger's longest jump was 5.30 m.
Andy's longest jump was 5.25 m.
The difference is 5.30 – 5.25 = 0.05 m.

7. 32

To find the answer you need to work backwards. You're told that a number was divided by 4 to make 131 — so the number was 131 × 2 = 262.
You're told that 6 was added to a number to make 262, so subtract 6 from 262. 262 – 6 = 256.
You're told that a number was multiplied by 8 to make 256, so divide 256 by 8.
256 ÷ 8 = 32

8. 50 minutes

Divide 1 litre by 20 ml to see how many minutes it will take.
1 litre = 1000 ml. So work out 1000 ÷ 20.
You can make this easier to work out by dividing both numbers by 10, so that's 100 ÷ 2 = 50 mins

9. 10%

The amount of discount received off the original price of £27.50 was £27.50 – £24.75 = £2.75.
2.75 = 27.50 ÷ 10, so the discount is 1/10 of the original price. This is the same as 10%.

10. 2:1

There are 8 circles and 4 squares.
This is a ratio of 8 : 4.
This can be simplified by dividing both sides by 4.

11. 1:1

There are 2 grey squares and 2 white squares.
This is a ratio of 2 : 2, or 1 : 1 in its simplest form.

12. C

There are 3 white circles and 12 shapes in total.
This gives a fraction of 3/12.
This can be simplified by dividing the numerator and denominator by 3 to give ¼.

13. 500 g

The ingredients given make 12 cakes.
40 cakes = 3 lots of 12 cakes + 4 cakes.
4 cakes = ⅓ of 12 cakes. She will need to multiply the amount of butter given by 3⅓.
You can partition 3⅓ into 3 + ⅓.
⅓ × 150 g = 150 ÷ 3 = 50 g
150 g × 3 = 450 g
So the total amount of butter is
450 g + 50 g = 500 g

14. 70

We are told 240 g of flour makes 12 cupcakes.
Each cupcake requires 240g ÷ 12 = 20 g of flour.
1.4 kg is equivalent to 1.4 × 1000 = 1400 g of flour. The number of cupcakes that can be made with 1400 g of flour is 1400 ÷ 20 = 140 ÷ 2 = 70 cupcakes.

15. 26

Read the number of children who chose plum and the number who chose pear off the horizontal axis.
The number who chose plum is halfway between 28 and 32 so 30 children chose plum.
The number who chose pear = 4. Subtract to find how many more children chose plum than pear:
30 – 4 = 26.

16. A

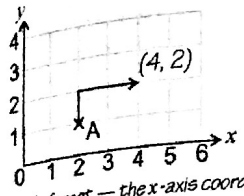
4 children chose pear and 24 children chose apple, so 24 + 4 = 28 children chose either pear or apple.
For a fruit to be half as popular, it would have to be chosen 28 ÷ 2 = 14 times.
Orange was chosen 14 times.
Peach was chosen 28 times.
Plum was chosen 30 times.
Banana was chosen 18 times.
Therefore the answer is orange.

17. £17.40

Bella gets 6 boxes of 20 cards for 4 × £3.90.
Partition £3.90 into £3 + 90p
4 × £3 = £12, 4 × 90p = £3.60
£12 + £3.60 = £15.60.
She also gets a box of 12 envelopes for £1.80
Total cost = £15.60 + £1.80 = £17.40

18. (4, 2)

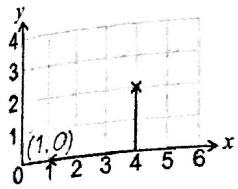
Here is the route she follows:



Don't forget — the x-axis coordinate always goes first when you're writing coordinates.

19. (1, 0)

Here is the route she follows from the point (4, 2):



20. £15

If Amanda spent 60% of her pocket money, she must have 40% left. 40% = £6,
so 10% would be £6 ÷ 4 = £1.50.
So 100% would be 10 × £1.50 = £15

21. 11:05

If Kate travels at 60 km/h, she will cover 2 × 60 = 120 km in 2 hours.
She then goes a further 15 km (135 – 120).
15 km is ¼ of 60 km, so she will travel 15 km in ¼ of an hour. She travels for 2¼ hours in total. If she starts at 8:50 am, 2 hours later will be 10:50 am and 15 minutes after this will be 11:05 am.

22. E

The mean of a set of four numbers is the total of the numbers divided by 4. So if the mean is 4, the total of the numbers is 4 × 4 = 16.
The two sides you can see add up to 11 (3 + 8).
So the two hidden sides must add up to 16 – 11 = 5. The only pair of numbers in the answer choices that add up to 5 is 1 and 4.

23. 8.1 litres

Convert 900 ml into litres by dividing by 1000.
900 ÷ 1000 = 0.9 litres
Add up the three volumes:

$$\begin{array}{r} 4.4 \\ 0.9 \\ +\,2.8 \\ \hline 8.1 \\ {\scriptstyle 2} \end{array}$$

24. 85%

To convert from fractions into percent, multiply the numerator and denominator by the same number until the denominator equals 100. The numerator is now equal to the percentage. 100 ÷ 20 = 5. Therefore you need to multiply the numerator by 5 to get the percentage. 17 × 5 = 85%.

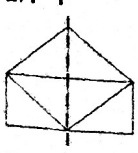
25. 67°

Put n = 46° into the formula.
m = (180 – 46) ÷ 2
m = 134 ÷ 2 = 67°

26. 72 m²

To calculate the area of one triangle:
(6 × 4) ÷ 2 = 12 m².
The playground is made up of six triangles so the total area is 12 × 6 = 72 m²

27. 1



There is 1 line of symmetry shown above with the dashed line.

28. 19 m³

Volume = width × height × length
The volumes of the cube and the cuboid can be calculated separately.
Cuboid: 5.5 × 1 × 2 = 11 m³
Cube: 2 × 2 × 2 = 8 m³
The total volume is the sum of the volumes of the cube and cuboid. 11 + 8 = 19 m³

29. 375 g

First find out how many 2ps make up £1.
£1 = 100p, so there are 100 ÷ 2 = 50 coins in each pile. Each pile should weigh 50 × 7.5 = 375 g.

30. 75 kg

From question 29 you know that £1 of 2p's weighs 375 g = 0.375 kg. Multiply this by 200 to get the weight of £200 of 2p's.
0.375 × 200 = 0.375 × 100 × 2
= 37.5 kg × 2 = 75 kg

Assessment Test 2

Section A
Pages 53-56

1. D

There are 8 segments and 3 are shaded.
This is the fraction 3/8.

2. 34 minutes

The slowest time was 156 minutes and the fastest was 122 minutes. 156 – 122 = 34

3. B

You need to find the piece that is the right size and shape to fit in the gap. Shape B is the only shape that fits in the gap.

4. A

A small can of beans weighs around 250 g. All of the other weights are either too small or too large.

5. B

21² is 21 × 21. You can estimate the answer by rounding the numbers to the nearest 10 and working out 20 × 20.
20 × 20 = 400. The only realistic option is B: 441.

6. B

For B, the dial is split into 8 parts and 1 kg is at the 4th point, halfway round the scale. This means each point on the scale represents 1 kg ÷ 4 = 250 g.
As the arrow is pointing at the 3rd point, it is pointing at 3 × 250 g = 750 g.

7. 9 m

To find the length of 20 scarves you need to multiply 45 cm by 20: 45 × 20 = 900 cm.
There are 100 cm in 1 m, so 900 cm = 9 m

8. 145.75 cm

The difference between 145.6 and 145.9 is 145.9 – 145.6 = 0.3.
0.3 ÷ 2 = 0.15 so the halfway point between the two numbers will be 145.6 + 0.15 = 145.75

9. 6

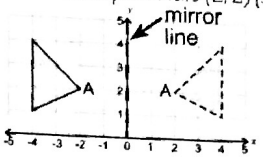
Dogs have 2½ symbols and fish have 1 symbol so the difference between them is 1½ symbols.
Each symbol in the pictogram is equal to 4 people.
So half of a symbol is 4 ÷ 2 = 2 people.
1½ symbols is equal to 4 people + 2 people = 6 people

10. B

Elsa has 7 + 8 + 3 = 18 sweets to start with.
She eats 2 chocolates so there are 16 sweets left (18 – 2 = 16). There are still 8 toffees left, so 8/16 of the sweets left in the bag are toffees. Divide the numerator and denominator by 8 to find 8/16 = ½.

11. E

The y-axis is the vertical axis so the coordinates of the reflected point A are (2, 2) (see the diagram).



12. £45

If you add up the portions that Eloise, Lucinda and Jennifer get all together, 5 + 3 + 2 = 10.
Calculate the amount in one share:
£150 ÷ 10 = £15
Eloise, Lucinda and Jennifer share the money in a 5 : 3 : 2 ratio. Lucinda receives a share of 3, and therefore gets 15 × 3 = £45

13. E

The number 26 is an even number, but it isn't a multiple of 3 or a multiple of 7, so it can't be placed in the sorting table.

14. C

When you reflect the clear pentagon in a horizontal line it looks like this:

The only option where the clear pentagon looks like this is option C.

15. 72 minutes

Work out the length of time that the journey takes on each bus. On Bus A the journey takes
9:44 to 10:44 = 60 minutes
plus 10:44 to 10:56 = 12 minutes.
60 + 12 = 72 minutes.
On Bus B the journey takes
11:39 to 12:39 = 60 minutes
plus 12:39 to 12:48 = 9 minutes.
60 + 9 = 69 minutes.
The journey on Bus A is longer, so the longest time is 72 minutes.

16. A

When you multiply two odd numbers together you always make an odd number. So 113 × 115 will give an odd number as the answer.

17. A

Silver, purple and blue were each chosen once, gold and green were each chosen twice but red was chosen three times, so red is the most popular.

18. 9

Ester won 32 prizes altogether so subtract the number she won on the other days from 32 to find the number she won on Thursday:
32 – 5 – 8 – 4 – 6 = 9

19. D

Look at each statement and decide if it's true:
A: ¾ = 75/100, so 7/100 isn't greater than ¾.
B: 7/100 = 0.07, so 7/100 isn't greater than 0.65.
C: 7/100 = 0.07, so 7/100 isn't greater than 0.09.
D: ¾ = 0.75, so 0.65 is less than ¾.
E: 0.65 is greater than 0.09.

20. B

The cactus plants come in boxes of 12 and Lemone needs 60 plants so she needs 60 ÷ 12 = 5 boxes.
The cost of 5 boxes is shown in the expression as 5C. She needs to add this to the cost of the stall, S, so the complete expression is S + 5C.

21. 2

The total angle around the point at the centre of the spinner is 360° and there are 8 sections, so the size of each section is 360° ÷ 8 = 45°.
360° – 45° = 315° so the arrow is being turned in an anti-clockwise direction through 7 segments (8 – 1 = 7) which will leave it pointing at number 2.

22. D

25 × 4 = 100, so it takes 4 days to run 100 miles.
The number of days to run 800 miles will be
4 × 8 = 32 days.
This leaves 74 miles left over. 25 × 3 = 75 so it'll take 3 days to complete the last 74 miles.
32 days + 3 days = 35 days

23. 6 cm²

You can work out the area of a rectangle by finding length × width.
So, the area of the flag is 6 × 4 = 24 cm².
The flag is split into 4 equal rectangles, so the area of the shaded rectangle is 24 ÷ 4 = 6 cm²

24. D

46 is 23 doubled, so 46 × 14 is 23 × 14 doubled.
So 46 × 14 = 322 × 2 = 644
140 is 10 times larger than 14,
so 46 × 140 = 644 × 10 = 6440 sweets

25. 24

$\frac{2}{3}$ of the socks are white. There are 36 socks in total, so the number of white socks is $\frac{2}{3}$ of 36.
$\frac{1}{3}$ of 36 = 36 ÷ 3 = 12
So $\frac{2}{3}$ of 36 is 2 × 12 = 24 socks

26. D

n is the number of the term. Test each formula by substituting different values for n.
E.g for option D: $n - (n + 1)$:
When n is 1: $1 - (1 + 1) = 1 - 2 = -1$.
When n is 2: $2 - (2 + 1) = 2 - 3 = -1$.
When n is 3: $3 - (3 + 1) = 3 - 4 = -1$.
So $n - (n + 1)$ is the correct formula.

27. C

For Julie to have shared the carrots equally, whilst having none left over and not having to divide any, the number of rabbits must be a factor of the number of carrots, 70.
The only factor of 70 is 5 (70 ÷ 5 = 14).

28. D

Four squares north takes Adam to (−1, 2). Two squares east takes him to (1, 2).

29. D

$3(p + 6t)$ means:
$p + 6t + p + 6t + p + 6t = 3p + 18t$

30. 68%

To find a percentage you need to write an equivalent fraction over 100.
$\frac{16}{50}$ people had a blue car and when you multiply the numerator and denominator in $\frac{16}{50}$ by 2 you get $\frac{32}{100} = 32\%$.
The percentage of people who didn't have a blue car is 100% − 32% = 68%

Section B
Pages 56-58

1. C

Add the prices of the sets of three board games together. You need to find the option that adds up to £30.00 − £0.50 = £29.50.
This is easiest if you split the numbers and add the pounds and pence separately.
Blocks + Clueless + Trivia Time
= £12.50 + £6.50 + £10.50
= £12 + £6 + £10 + £0.50 + £0.50 + £0.50
= £28 + £1.50 = £29.50

2. £9.50

Two copies of Brainium cost £9.50 × 2 = £19.
Three copies of Trivia Time cost
£10.50 × 3 = £31.50
Together they cost £19 + £31.50 = £50.50.
Jill paid with 3 × £20 = £60. The change she received was £60 − £50.50 = £9.50

3. 50 cm²

The area of each square is length × width
= 4 × 4 = 16 cm².
The area of $\frac{1}{2}$ a square = 16 ÷ 2 = 8 cm².
1 whole square + 3 halves
= 16 + 8 + 8 + 8 = 40 cm²
She uses 2 half circles so 1 circle in total.
The total area of the circle is 10 cm².
So, the total area is 40 + 10 = 50 cm²

4. 4 m

The area of each tile is 0.04 m² and Moses uses 100 tiles to cover the floor, so the total area of the bathroom is 100 × 0.04 = 4 m².
The area of the bathroom is calculated using length × width, so area ÷ width = length:
4 ÷ 1 = 4 m

5. 11:9

White tiles occupy 55% of the floor while black tiles cover 45%. Written as a ratio this is 55:45.
The highest common factor of 55 and 45 is 5.
Dividing both sides by 5 gives the ratio in its simplest form, 11:9.

6. 1.8 m²

The total area of the bathroom is 4 m².
10% of the overall area is 4 ÷ 10 = 0.4 m²
and 5% of the overall area is 0.4 ÷ 2 = 0.2 m².
Therefore 45% of the total area is
(0.4 × 4) + 0.2 = 1.6 + 0.2 = 1.8 m².

7. 120°

Each angle in an equilateral triangle is 60°.
The shaded angle is made up of the angles from two equilateral triangles so it is 60° + 60° = 120°

8. 12

In total, the girls have $H + (H + 2) + 2H$ handbags.
If they have 26 handbags altogether, this can be written as: $26 = H + (H + 2) + 2H$.
This is simplified to: $26 = 4H + 2$.
Subtract 2 from both sides: $24 = 4H$
So $H = 24 \div 4$, so $H = 6$.
Louise has $2H$ handbags.
2 × 6 = 12 handbags.

9. C

Amy has $H + 2$ handbags.
Georgina has 3 times this.
$(H + 2) + (H + 2) + (H + 2) = 3H + 6$

10. 91

£2.73 is made up evenly of 2p and 1p coins.
1p out of every 3p is a 1p coin, so $\frac{1}{3}$ of the money is made up from 1p coins.
£2.73 is 273p and $\frac{1}{3}$ of 273 is 273 ÷ 3 = 91.
So, 91 coins are 1p coins.

11. 30

	Girls	Boys	Total
Goals		4	
Saves	14	= (20 − 4) = 16	= (16 + 14) = 30
Total	24	= (44 − 24) = 20	44

The table shows how to find the total number of saves. Start by working out the boys' total goals and saves (20). Then use this to find the number of the boys' saves (16). Add this to the girls' saves to find the total number of saves (30).

12. 5000

The length of each matchbox is 5 cm. This will fit along one side of the box 50 × 5 = 10 times.
The width of each matchbox is 2 cm. This will fit along one side of the box 50 × 2 = 25 times.
So one layer of matchboxes = 10 × 25
= 250 matchboxes.
The height of each matchbox is 1 cm, so the box is high enough to fit 20 ÷ 1 = 20 layers of matchboxes in it. So the total number of matchboxes = 20 × 250 = 5000

13. 125 000

In question 12, it was calculated that there were 5000 matchboxes in the packing box.
If there are 25 matches in each match box, there are 5000 × 25 matches in the packing box in total.
You can calculate this by finding 25 × 1000 × 5
25 × 1000 = 25 000, 25 000 × 5 = 125 000.

14. £16

The cost of tickets for 2 adults and 2 children is
£3.50 + £3.50 + £1.50 + £1.50 = £10
A family ticket is 20% cheaper —
10% of £10 is £1 so 20% is £2.
So a family ticket is £10 − £2 = £8
Raj is buying two family tickets so the total cost is £8 × 2 = £16

15. 5

The number of sausage rolls eaten by the children is 24 × 3 = 72 and the number eaten by the adults is 7 × 5 = 35. So the total number of sausage rolls eaten is 72 + 35 = 107.
The sausage rolls come in packets of 25.
4 × 25 = 100 so Sherrie will need to buy 5 packets to have 107 sausage rolls.

16. 4

There are 7 adults who eat $\frac{1}{7}$ of a cake each.
7 × $\frac{1}{7}$ = 1 cake
There are 24 children who eat $\frac{1}{8}$ of a cake each.
24 × $\frac{1}{8}$ = 24 ÷ 8 = 3 cakes
In total Sherrie needs 1 + 3 = 4 cakes

17. 10 years

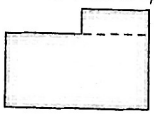
The plant needs to grow 0.5 m (2 − 1.5 = 0.5).
It grows 0.025 m in 6 months.
There are 12 months in a year so it will grow 0.025 × 2 = 0.05 m in a year.
0.5 m ÷ 0.05 m = 10, so it'll take the plant 10 years to grow 0.5 m.

18. 9 m

The vertical sides of the shape measure 1 + 6 + 7 = 14 m. So, the total of the horizontal sides of the shape is 32 − 14 = 18 m.
The bottom horizontal line is equal to the 2 top sides added together so the bottom horizontal line is half of the remaining perimeter.
The length of X (the bottom) is 18 ÷ 2 = 9 m.

19. 58 m²

Area of a rectangle = width × height.
The house can be split up into two rectangles.



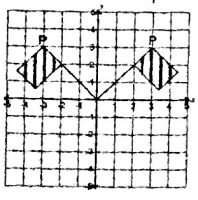
The bottom rectangle has an area of 6 × 9 = 54 m²
The upper rectangle has an area of 4 × 1 = 4 m²
The total area is 54 + 4 = 58 m²

20. 25%

The total amount of paint used by Harry is 3 + 4 + 5 = 12 litres.
3 litres of this was red paint, so the fraction of red paint used is $\frac{3}{12}$. $\frac{3}{12}$ is simplified to $\frac{1}{4}$ by dividing the numerator and denominator by 3, and $\frac{1}{4}$ = 25% (25% × 4 = 100%).

21. A

The diagram shows the flag when it has been reflected in the y-axis.
The coordinates of point P are now (−3, 3).



22. B

n is the number of the term. To find the first term, substitute 1 for *n* in the expression $3n^2 + 1$ (remember to follow BODMAS):

$3 \times 1^2 + 1 = 3 \times 1 + 1 = 3 + 1 = 4$

To find the second term, *n* is 2:

$3 \times 2^2 + 1 = 3 \times 4 + 1 = 12 + 1 = 13$

23. 12 cm³

The volume of each cube of cheese is $2 \times 2 \times 2 = 8$ cm³.

There are 3 cubes of cheese, so the total volume of cheese is $8 \times 3 = 24$ cm³.

The mouse eats 12 cm³ of cheese, so the amount left is $24 - 12 = 12$ cm³

24. D

The regular pentagon has 5 sides that are all $(2x - y)$ m.

$5(2x - y) = 2x - y + 2x - y + 2x - y + 2x - y + 2x - y = 10x - 5y$

25. 90 m

You can substitute the values $x = 10$ and $y = 2$ into the expression from question 24.

$10 \times 10 - 5 \times 2 = 100 - 10 = 90$ m

Alternatively, substitute the values of *x* and *y* into the expression for one side of the pen

$2 \times 10 - 2 = 20 - 2 = 18$ m

There are 5 sides to the pen so the total perimeter is $18 \times 5 = 90$ m

26. 33

Brian needs 50 m² for every 3 sheep.

You need to work out how many lots of 50 m² there are in 555 m².

$555 - 50 = 11$ remainder 5. For every 50 m² Brian can have 3 sheep. Since there are only 11 full lots of 50 m², Brian can fit $11 \times 3 = 33$ sheep in the pen. There is a remainder of 5 m² which is not big enough for one sheep.

27. 136°

A kite is a quadrilateral so the angles in a kite add up 360°. This means that the angle missing in the kite is $360° - 130° - 130° - 56° = 44°$

Angles on a straight line add up to 180°, so angle *a* is $180° - 44° = 136°$

28. C

Round up 49p to 50p and 29p to 30p to make the calculations easier. Carrie bought 4 chocolate bars so the approximate price of these is $4 \times 50p = £2$. She bought 7 bags of peanuts so the approximate price of these is $7 \times 30p = £2.10$.

£2 + £2.10 = £4.10. You rounded each item up by 1p and there were 11 items in total (4 + 7 = 11) so subtract 11p to find the exact total cost:

£4.10 − 11p = £3.99

29. 8 hours

Start by making sure everything is in the same units — there were 2 litres of water, so change this to millilitres by multiplying by 1000: $2 \times 1000 = 2000$ ml. There are 5 holes each losing 50 ml each hour, so the amount of water being lost each hour is $5 \times 50 = 250$ ml. Divide the total volume of water (2000) by the amount being lost each hour (250) to find the number of hours it'll take to empty:

$2000 \div 250 = 8$ hours

30. 120 minutes

If one hole is stoppered then only $4 \times 50 = 200$ ml of water will be lost per hour.

$2000 \div 200 = 10$ hours.

This is $10 - 8 = 2$ hours more than when all 5 holes are losing water. 2 hours is $60 \times 2 = 120$ minutes.

Assessment Test 3

Section A

Pages 59-61

1. 6.5 cm²

The area of a whole square is 1 cm², so the area of half a square is 0.5 cm². There are 5 whole squares with an area of 5×1 cm² = 5 cm², and 3 half squares with an area of 3×0.5 cm² = 1.5 cm², so the total area is $5 + 1.5 = 6.5$ cm²

2. C

Litres is not a unit of length. Centimetres and millimetres are too small. Kilometres are too big. So metres is the most suitable unit.

3. 7

Each rectangle represents 4 vehicles, so ¼ of a rectangle represents 1 vehicle.

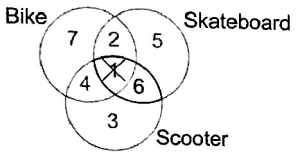
There are 1¾ rectangles for the buses.

This is equivalent to 4 buses for the whole rectangle and 3 buses for the ¾ rectangle.

$3 + 4 = 7$ buses

4. 6

The children with a skateboard and a scooter are shown in the overlap of the skateboard and scooter circles. The 1 child in the middle section also has a bike, so you don't want to count that one.



5. E

E (a trapezium) is the only shape with one pair of parallel sides (the top and bottom). A and B have more than one pair of parallel sides.

C and D have no parallel sides.

6. A

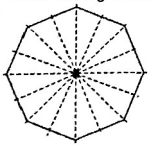
In the 24 hour clock, if the number of hours is greater than 12, the time is pm.

To convert from the 24-hour clock to the 12-hour clock subtract 12 from the hours, in this case, 13. $13 - 12 = 1$.

So the answer is 1:45 pm.

7. D

There are eight lines of symmetry:



8. 113

Add up the number of boys and girls in each year:

Year 2: $49 + 50 = 99$

Year 3: $52 + 56 = 108$

Year 4: $55 + 57 = 112$

Year 5: $54 + 59 = 113$

Year 6: $35 + 54 = 89$

Year 5 is the biggest year group and has 113 children.

9. 7.2

0.08 is 1000 times smaller than 80, so 90×0.08 will be 1000 times smaller than 90×80.

$90 \times 80 = 7200$, so $90 \times 0.08 = 7200 \div 1000 = 7.2$

10. B

400 g is the only sensible answer. 4 kg and 40 kg are too big. 4 g and 0.4 g are too small.

11. C

Total up the 3 items Maddy chose and subtract the total from £5.00.

40p + 25p + 99p = £1.64 (to add on 99p, add on £1 and subtract 1p).

£5.00 − £1.64 = £3.36

12. B

Convert all the fractions to twentieths so they're easier to put in order:

$\frac{3}{4} = \frac{15}{20}$ (Multiply the numerator and denominator by 5.)

$\frac{1}{5} = \frac{4}{20}$ (Multiply the numerator and denominator by 4.)

The other three fractions are already in twentieths.

In order from smallest to largest, the fractions are: $\frac{3}{20}, \frac{4}{20}, \frac{5}{20}, \frac{7}{20}, \frac{15}{20}$

Convert the fractions back to their original form to give: $\frac{3}{20}, \frac{1}{5}, \frac{5}{20}, \frac{7}{20}, \frac{3}{4}$

13. 12

From the chart, you can see that 70% of children in the computer club are boys.

There are 30 children in the club, so find 70% of 30.

10% of 30 = 30 ÷ 10 = 3

so 70% = 7 × 10% = 7 × 3 = 21.

There must be 30 − 21 = 9 girls.

So there are 21 − 9 = 12 more boys than girls.

14. C

The fastest time is the smallest number. Cara was fastest with 3 mins 59 secs. All the other times are over 4 minutes so compare the seconds.

Ian came second with a time of 4 mins 2 secs.

15. 11

To find the answer you need to work backwards from 112. You're told that 9 was subtracted from a number to make 112 — so add 9 to 112:

112 + 9 = 121. To reach 121 the original number was multiplied by 11. So you need to divide 121 by 11 to find the original number: 121 ÷ 11 = 11

16. D

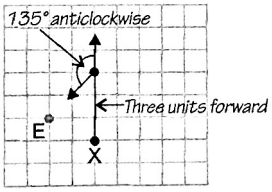
The square numbers on a six-sided dice are 1 and 4. This is 2 out of the 6 numbers, so the fraction is

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

17. E

The map below shows Jenny's movements.

Remember — 90° is a right angle, so 135° is one and a half right angles (90° + 45°).



18. 6:05 pm

1¾ hours = 1 hour 45 mins.

Count on 1 hour and 45 mins from 4:20 pm.

One hour later than 4:20 pm is 5:20 pm,

40 minutes later than 5:20 pm is 6:00 pm,

5 minutes later than 6:00 pm is 6:05 pm.

Alternatively, 1¾ hours is 15 minutes less than 2 hours. So you could add on 2 hours and then subtract 15 minutes.

19. 2 km

Sarah runs on $7 \times 12 = 84$ days

Each day she runs $168 \div 84 = 2$ km.

20. C

You need to imagine spinning the shape round to different positions. This question is easier if you rotate the page so that the cube with the heart is at the top each time.

21. 20 cm

The perimeter of a rectangle is made up of 2 lengths and 2 widths. In this rectangle,
length = width + 20 cm, so the perimeter is
2 widths + 2 widths + 20 cm + 20 cm
= 4 widths + 40 cm
The perimeter is 120 cm, so 4 widths is
120 cm − 40 cm = 80 cm
So 1 width is 80 cm ÷ 4 = 20 cm

22. 2.25 °C

The highest temperature was 38.25 °C on Saturday. The lowest temperature was 36 °C on Monday and Wednesday.
So the difference = 38.25 − 36 = 2.25 °C

23. E

Count up from −5 in steps of 1.5 until you land on one of the answer choices.
−5, −3.5, −2, −0.5, 1, 2.5, 4 (which is E).

24. B

The pattern is made by repeating a set of three shapes.
3 × 6 = 18, so there will be 6 full sets of the shapes, plus another two that make up the first 20 shapes.
The heart is the 1st shape in the pattern, so shape 19 will be a heart.
So there will be 6 + 1 = 7 hearts

25. 597 miles

If Sue can travel 2985 miles on 5 tanks, she can travel 2985 ÷ 5 miles on 1 tank:

$$5\overline{)2985}\quad 597$$

26. 31

You could do this question by predicting what the 11th shape will look like and counting the squares.
Shape 11 will have a vertical strip of 11 squares, and the horizontal strips sticking out the sides will be 10 squares long each. The total number of squares will be 11 + 10 + 10 = 31
Alternatively, you could say that the number of squares increases by 3 each time. There are 10 squares in Shape 4, and Shape 11 is 7 shapes further on.
So Shape 11 will have 7 × 3 = 21 more squares than Shape 4.
This means it has 10 + 21 = 31 in total.

27. 11

1.75 pints = 1 litre, so 6 litres = 6 × 1.75 pints.
Split the calculation up to make it easier.
2 litres = 2 × 1.75 = 3.5 pints
6 litres = 3 × 2 litres, so:
6 litres = 3 × 3.5 = 10.5 pints
So you'd need 11 bottles.

28. B

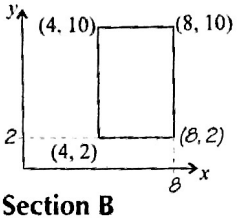
Consider whether each statement is true:
A: There are 4 even numbers and only 2 odd, so this isn't true.
B: 4 numbers out of 6 are even, which simplifies to 2 numbers out of 3. The statement is true.
C: The ratio of odd to even is 2 : 4 which simplifies to 1 : 2. So the statement isn't true.
D: 4 out of 6 sections are even which is $\frac{4}{6} = \frac{2}{3}$
This isn't equal to 75% so the statement isn't true.
E: Only 2 of the 6 sections are prime numbers (2 and 5) so this statement isn't true.

29. D

First find what fraction of the bottle she has used by simplifying: $\frac{125}{500} = \frac{25}{100} = \frac{1}{4}$.
Then find what fraction of the bottle of shampoo is left: $1 - \frac{1}{4} = \frac{3}{4}$

30. (8, 2)

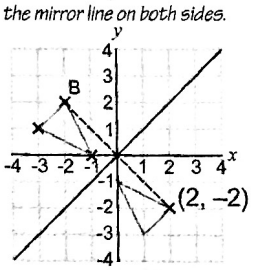
The fourth corner is directly below the point (8, 10) so it will have the same x-coordinate (8).
It is directly to the right of the point (4, 2) so it will have the same y-coordinate (2).
So the coordinates of the missing corner are (8, 2).



Section B
Pages 62-64

1. D

The reflected point is the same distance away from the mirror line on both sides.



2. C

The mean is 5 so the total age of all the babies is 5 × 6 = 30. The four ages that are given add up to 6 + 3 + 8 + 2 = 19, so the other two ages must add up to 30 − 19 = 11. This means that the correct answer must be C (3 and 8).

3. B

The whole pie chart represents 20 days.
If 20 days = 360°, then 1 day = 360° ÷ 20 = 18°
3 foggy days will be represented by an angle of 3 × 18° = 54°

4. 6

From question 3, one day is represented by 18°.
Therefore 108° corresponds to 108 ÷ 18 = 6 days (as 54 ÷ 18 = 3 and 108 is double 54).

5. 26

A cube has 6 faces, 12 edges and 8 vertices (corners). 6 + 12 + 8 = 26.
If you don't know these, you could count them on the diagram in the question.

6. 6 cm

This can be done using trial and error. To calculate the length of one edge, the cube root of 216 needs to be found:
4 × 4 × 4 = 64
5 × 5 × 5 = 125
6 × 6 × 6 = 216

7. £50

Substitute 300 for m in the formula and find C.
Remember to follow BODMAS.
$C = 15(300 \div 100) + 5$
$C = 15(3) + 5$
$C = 45 + 5$
$C = 50$
The cost of printing 300 leaflets is £50.

8. B

There are 1000 ml in 1 litre, so in 10 litres, there are 10 000 ml.
$\frac{2}{5}$ of a litre = $\frac{2}{5} \times 1000$ ml = (1000 × 2) ÷ 5
= 2000 ÷ 5 = 400 ml
So the amount left in the bucket = 10 000 − 400
= 9600 ml

9. 4.5 kg

7.5 kg of rabbit flakes are used which corresponds to 5 parts. So one part is 7.5 ÷ 5 = 1.5 kg.
There needs to be 3 parts of hay, so
1.5 × 3 = 4.5 kg is needed.

10. 31.5 kg

There are 1 + 3 + 5 = 9 parts in the mix and vegetables only make up 1 part of it.
There are 3.5 kg of vegetables in the mix and so the total weight is 3.5 × 9. Split this up into 3 × 9 = 27 and 0.5 × 9 = 4.5 and add them together, 27 + 4.5 = 31.5 kg.

11. 95

The number of children can be found by identifying the correct bar (the darker grey bar) and reading off the values on the y-axis.
On Monday 30 children used the ferry.
On Tuesday 40 children used the ferry.
On Wednesday 25 children used the ferry.
In total on the first three days:
30 + 40 + 25 = 95 children used the ferry.

12. 70

Add up the total number of children who used the ferry: 30 + 40 + 25 + 15 + 55 + 35 + 35 = 235
Add up the total number of adults who used the ferry: 15 + 25 + 10 + 30 + 10 + 35 + 40 = 165
Then find the difference: 235 − 165 = 70.

13. D

On Thursday 30 adults and 15 children used the ferry. 15 is half of 30.

14. 25

Wednesday had the fewest passengers (35) and 25 of them were children.

15. 210

The calculation is easier if you notice that 11 + 12 + 13 + 14 + 15 + 16 + 17 + 18 + 19 + 20 is the same as (1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10) + (10 × 10). You are told in the question that the sum of the numbers from 1 to 10 is 55.
So the total = 55 + 55 + 100 = 210

16. 8

The prime numbers between 1 and 20 are:
2, 3, 5, 7, 11, 13, 17 and 19.

17. B

The minute hand will go round 10.5 times between 12 noon and 10:30 pm. It travels through 360° each time it goes round. So the total angle it travels through is 10.5 × 360°. Split this up into 10 × 360° = 3600° and 0.5 × 360° = 180°, then add them up: 3600° + 180° = 3780°

18. £9.75

Find 30% of £2.50: 10% of £2.50 = £0.25
30% = 3 × 10% = 3 × £0.25 = £0.75
So if he cleans the car one week he gets
£2.50 + £0.75 = £3.25
So for 3 weeks he gets £3.25 × 3 = £9.75

19. 52 m²

First find the area of the whole garden, then subtract the area of the flower bed. This gives you the lawn area.
Garden = 8 × 8 = 64 m²
Flower bed = 4 × 3 = 12 m²
Lawn = 64 − 12 = 52 m²

20. 1 hour 5 minutes

In question 19, it was calculated that the lawn is 52 m². It takes Tamara 5 minutes to mow 4 m² of lawn. In 52 m² there are 52 ÷ 4 = 13 lots of 4 m².
It will take Tamara 5 × 13 = 65 minutes to mow the lawn.
This is equivalent to 1 hour and 5 minutes.

21. B

Ian has rounded each item up by 1p. There are 9 items, so his estimate will be 9p too much.

22. 3
Read off how many °C is the same as 25 °F from the graph — it's approximately −4 °C. The table tells you that the minimum temperature for a sleeping bag with rating 3 is −5 °C. This is the lowest rated sleeping bag he can get.

23. 18
The percent accounted for by red, blue and green marbles is 25% + 30% + 15% = 70%
The percent of yellow marbles in the bag is
100% − 70% = 30%
10% of 60 is 60 ÷ 10 = 6 marbles.
30% is 3 × 6 = 18 marbles

24. C
15% = $^{15}/_{100}$ of the marbles are green. Dividing the numerator and denominator by 5 simplifies this fraction to $^{3}/_{20}$.

25. 30 m³
Area of the triangular side = ½ × base × height
= ½ × 3 × 2 = 3 m²
Volume = area of triangular side × length
= 3 × 10 = 30 m³

26. 2016
Find the total number of seats (42 × 48):

$$\begin{array}{r} 48 \\ \times\ 42 \\ \hline 96 \\ +1920 \\ \hline 2016 \end{array}$$

27. 14
To calculate the mean, add all numbers together and divide by the number of classes.
Mean = (16 + 16 + 11 + 17 + 12 + 12) ÷ 6
= 84 ÷ 6 = 14 children

28. D
There are seven days in one week. Count on six lots of seven from 23rd April. There are 30 days in April and 31 in May.
30th April, 7th May, 14th May, 21st May, 28th May, 4th June.

29. D
1 game costs £39.99, so n games will cost him n × 39.99 = 39.99n
The computer cost £260.
Subtract these amounts from £500 to find what he has left over:
500 − 260 − 39.99n = 240 − 39.99n

30. 6
Russell has £240 remaining from his £500 to spend on games. Each game costs £39.99 which can be rounded to £40.
£240 ÷ £40 = 6. Therefore, since we rounded £39.99 up to £40, Russell can afford 6 games.

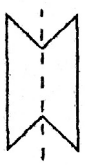
Assessment Test 4

Section A
Pages 65-68

1. E
1 million is 1 000 000, so 7 000 000 is seven million.

2. A
Trees are usually taller than a person's height. The other measurements are all much smaller than a person's height.

3. D
A shape with six sides is formed, which is a hexagon.



4. A
−2 °C is the lowest temperature in the table.

5. 1 hour 20 minutes
The programme starts at 6:55 pm and finishes at 8:15 pm. Count on 1 hour from 6:55 pm to 7:55 pm. Then count on 5 minutes from 7:55 pm to 8:00 pm and a further 15 minutes to 8:15 pm. The total is 1 hour + 5 minutes + 15 minutes which gives 1 hour 20 minutes.

6. 17.5 cm²
The area of a rectangle is length × width. So the area is 7 × 2.5. Partition 2.5 into 2 and 0.5 and multiply each number by 7.
7 × 2 = 14. 7 × 0.5 = 3.5.
So 7 × 2.5 = 14 + 3.5 = 17.5 cm²

7. E
Only two of the numbers are less than 1: 0.81 and 0.18. 0.18 only has 1 tenth, whereas 0.81 has 8 tenths. So 0.18 is smallest.

8. 8 cm
Regular heptagons have seven equal sides, so each side is 56 ÷ 7 = 8 cm

9. £3919
Subtract the price Kate paid from the original price:
£6999 − £3080 = £3919
You can do this subtraction using partitioning:
6999 − 3000 − 80 = 3999 − 80 = £3919

10. C
There are 4 gaps on the scale between 2 kg and 4 kg. So each gap is worth 2 ÷ 4 = 0.5 kg.
The arrow is half a space further along than 2 kg on the scale. Half of 0.5 kg = 0.25 kg.
So the kitten weighs 2 kg + 0.25 kg = 2.25 kg

11. B
Joe ate an equal amount of three loaves over seven days, so he ate $^{3}/_{7}$ of a loaf each day.

12. E
The dogs sector of the pie chart is slightly bigger than a quarter of the chart.
Calculate a quarter of the 32 pets: 32 ÷ 4 = 8
9 is one more than 8. The other choices are too big or too small to be reasonable estimates.

13. B
9 is greater than 5, so 39 rounds up to 40.
3 is less than 5, so 43 rounds down to 40.
40 × 40 = 1600

14. 8:30 am
The latest bus arriving at Rippen before 8:40 am is the one that gets there at 8:35 am. This bus leaves Kneesall (where Lucas lives) at 8:30 am.

15. 144
Each piece is ⅓ m, so each metre of ribbon will make 3 pieces. Gus has 48 m of ribbon, so the total number of pieces = 3 × 48
You can calculate this by partitioning 48:
(3 × 40) + (3 × 8) = 120 + 24 = 144

16. B
Triangular-based pyramids have 4 triangular faces, 4 vertices and 6 edges.

17. E
403 is half of 806. So 30 × 403 must be equal to half of 30 × 806. As 30 × 806 = 24 180, 30 × 403 must be 24 180 ÷ 2 = 12 090

18. D
The angle is more than a right angle. It is about halfway between a right angle and a straight line — 135° is the only sensible estimate.

19. A
The horizontal line on the graph shows no distance was travelled between 09:00 and 10:30, which is 1 ½ hours. (Read the times off the horizontal axis.) This was when they were having a break.

20. 10
12 × 10 = 120, so 12 × 20 = 240
250 − 240 = 10. 10 is less than 12, so no more bags can be filled. So 10 biscuits are left over.

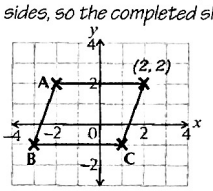
21. 64 cm
The shape Mark draws is a rectangle. The rectangle is the same length as seven cubes (7 × 4 = 28 cm). The rectangle is as wide as one cube (4 cm).
So the perimeter is 28 + 28 + 4 + 4 = 64 cm

22. C
There are 15 sweets altogether (5 + 10) and 5 of them are cherry. So $^{5}/_{15}$ of the sweets are cherry which simplifies to ⅓. (You simplify fractions by dividing the numerator and denominator by the same number — in this case 5.)

23. 15
The day with the most symbols on the pictogram is Monday wit 5 symbols. Each symbol stands for 3 awards so the class gained 3 × 5 = 15 awards on that day.

24. A
Find out how many of the balls would make up 55%.
55% = $^{55}/_{100}$ = $^{11}/_{20}$ so 11 of the 20 balls make up 55%. Then use the diagram to work out how many of each ball type there are:
Red = 4 + 7 = 11
Yellow = 6 + 3 = 9
Striped = 3 + 7 = 10
Spotted = 6 + 4 = 10
Red striped = 7
So red balls make up 55% of the balls in the bag.

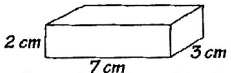
25. A
Parallelograms have two pairs of equal parallel sides, so the completed shape will look like this:



26. 8
49 is a square number: 7² = 49
So if x = 7, $x^2 - 1$ = 48, which is less than 49, so the statement isn't true. That means the answer must be 8 — if x = 8, $x^2 - 1$ = 63, which is greater than 49, so the statement is true.

27. C
Substitute one of the n values into each formula in turn, and see which gives you the correct value.
E.g. if n = 2.
A: 3n = 3 × 2 = 6 — not correct
B: n − 3 = 2 − 3 = −1 — not correct
C: 2n − 3 = 2 × 2 − 3 = 1 — correct
D: 2 ÷ n − 3 = 2 ÷ 2 − 3 = −2 — not correct
E: 2n + 3 = 2 × 2 + 3 = 7 — not correct
Only C gives the correct value, so must be the expression.

28. 42 cm³
The net folds up to form a cuboid:

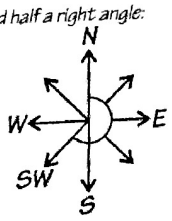


Volume = length × width × height
= 7 × 3 × 2 = 42 cm³

29. B
60% percent is $^{60}/_{100}$ = $^{6}/_{10}$ = $^{3}/_{5}$
If the price of an item is reduced by $^{3}/_{5}$ the new price will be 1 − $^{3}/_{5}$ = $^{2}/_{5}$ of it.
So if the amount is n, the sale price will be $^{2}/_{5}(n)$.

30. B

There are 180° in a half turn, 90° in a right angle, and 45° in half a right angle.
225° = 180° + 45°
= a half turn and half a right angle:



Section B
Pages 68-70

1. 22.105 litres

Add units = 5 + 5 + 5 + 5 = 20
Add tenths = 0.5 + 0.5 + 0.5 + 0.5 = 2
Add hundredths = 0.05 + 0.05 = 0.1
Add thousandths = 0.005 only
20 + 2 + 0.1 + 0.005 = 22.105 litres

2. 35

Find the number of groups by dividing the number of girls in the class by the number of girls in a group:
15 ÷ 3 = 5 groups.
The number of children in a group is 4 + 3 = 7, so the total number of children = 5 × 7 = 35.
Alternatively, find the number of boys in the class by multiplying the number of boys in a group by the number of groups: 4 × 5 = 20 boys.
15 girls + 20 boys = 35 children in total

3. 200

Work out the profit the school makes on each badge:
£1 − 70p = 30p
They made £60 or 6000p in total.
So divide 6000 by 30 to find the number of badges they bought. 6000 ÷ 30 = 200

4. 35

Use the opposite functions to work back from 25. To find the number divided by 7 to get 25, multiply 25 by 7: 25 × 7 = 175. To find the number that is multiplied by 5 to get 175, divide 175 by 5:
175 ÷ 5 = 35.

5. B

You can find the answer by rounding the prices of the sandwiches. The cost of three sandwiches at £1.49, is just less than £1.50 × 3 = £4.50. The other sandwich costs £1.99, which rounds to £2. So the total cost is about £4.50 + £2 = £6.50. You've rounded up by 1p for each sandwich, so the actual cost will be 4p less than £6.50, so answer B (£6.46) is correct.

6. 65p

First take off the cost of the two sausage rolls.
£3.79 = 379p
379p − 92p = 287p
287p − 92p = 195p
So the three jam donuts cost 195p.
So each jam donut costs 195p ÷ 3 = 65p

7. D

Convert prices in £ to pence, then divide the price by the number of cakes.
A 15p each
B 39p ÷ 3 = 13p each
C 100p ÷ 10 = 10p each
D 200p ÷ 25 = 8p each
E 150p ÷ 15 = 10p each
8p is the lowest price per cake.

8. 194

Find the square numbers between 46 and 91:
6 × 6 = 36 — too small, 7 × 7 = 49, 8 × 8 = 64, 9 × 9 = 81, 10 × 10 = 100 — too big.
49 + 64 + 81 can be partitioned by adding the tens and units separately:
(40 + 60 + 80) + (9 + 4 + 1) = 180 + 14 = 194

9. B

The options are all very different, so try estimating to find the answer. The base of each triangle is about 5 m, and the height of each triangle is 4 m.
Area = ½ × base × height = ½ × 5 × 4 = 2.5 × 4 = 10 m². The area of each triangle is about 10 m², so the area of the patio is about 2 × 10 = 20 m². The only answer that is possible is 19.2 m².

10. 41

The frequency just shows how many times each number has been thrown. Read off the frequency of each number and add them up to find out how many times the dice was thrown altogether:
6 + 7 + 8 + 5 + 9 + 6 = 41

11. B

The dog eats 245 g each meal, and she has 3 × 7 = 21 meals a week. So in one week, she eats 245 g × 21. The answers are all very different, so try estimating to find the answer.
Round 245 g up to 250 g, and 21 down to 20.
250 × 20 = 5000 g = 5 kg.
The only answer close to 5 kg is 5.145 kg.

12. C

Each meal is 245 g — round this up to 250 g.
Try multiplying this by each of the possible answers.
3 × 250 = 750 g, 4 × 250 = 1000 g,
5 × 250 = 1250 g, 10 × 250 = 2500 g,
12 × 250 = 3000 g. So the answer is 5.

13. £280

First work out how many hours a day the café is open for in the summer and in the winter.
Mar – Sep (summer): 9 am to 6 pm = 9 hours.
Oct – Feb (winter): 11 am to 4 pm = 5 hours.
So the café is open 4 hours (9 − 5) more each day in the summer. So it's open 4 × 7 = 28 hours longer per week in the summer. It costs £10 per hour to run the café, so it costs 28 × £10 = £280 more each week in the summer.

14. 22

Start by working out 1% of 550: 550 ÷ 100 = 5.5
Multiply this by 4 to get 4%. 5.5 × 4 = 22

15. 225°

All the angles inside a regular polygon are equal.
The angles around a point add up to 360°, so angle x = 360° − 135° = 225°.

16. E

4.5 kg of apple is needed for 2 kg of sugar.
So for 1 kg of sugar, you need 4.5 kg ÷ 2 = 2.25 kg apples.
10 kg of sugar needs 10 × 2.25 kg = 22.5 kg of apples
So for 9 kg of sugar you need
22.5 − 2.25 = 22.5 − 2 − 0.25
= 20.5 − 0.25 = 20.25 kg of apples
This is option E.

17. 3.75 kg

First find the mass of each type of fruit:

Oranges: 600 g × 1 = 600 g
Bananas: 450 g × 2 = 900 g
Apples: 500 g × 3 = 1500 g
Pears: 750 g × 1 = 750 g

Add up all the masses:
600 g + 900 g + 1500 g + 750 g
= 1500 g + 1500 g + 750 g
= 3000 g + 750 g = 3750 g

Convert the grams to kilograms:
1000 g = 1 kg, so 3750 g = 3.75 kg

18. 112.5 g

He buys two bags of bananas, so in total his bananas weigh 450 g + 450 g = 900 g.
To find the mean mass of a banana, divide this by 8: 900 g ÷ 8 = 112.5 g

19. D

Count the number of small triangles in each pattern and see how they relate to the pattern number:
Pattern 1 = 1 triangle
Pattern 2 = 4 triangles
Pattern 3 = 9 triangles
Pattern 4 = 16 triangles
Pattern 5 = 25 triangles
These are all square numbers. If the pattern number is n, then the number of triangles is n^2.

20. 1:01 pm

You can work out how long in hours 136 minutes is. There are 60 minutes in an hour, so in two hours there are 60 × 2 = 120 minutes. 136 − 120 = 16, so 136 minutes is 2 hours and 16 minutes.
2 hours after 10:45 pm is 12:45 pm and 16 minutes after this is 1:01 pm.

21. 1100 ml

First work out how many ml of milk Katie drinks each day: 350 ml twice a day is 350 × 2 = 700 ml.
Now find out how much milk she drinks a week.
700 × 7 = 4900 ml. She starts with 6 litres of milk, which is 6000 ml. So at the end of the week, she has 6000 − 4900 = 1100 ml left.

22. 45 cm³

There are 15 bricks in the model and each brick has a volume of 3 cm³ so the total volume is
3 × 15 = 45 cm³

23. C

6 out of the 15 bricks aren't touching the table.
As a fraction this is $\frac{6}{15}$.
6 ÷ 3 = 2 and 15 ÷ 3 = 5, so $\frac{6}{15} = \frac{2}{5}$

24. 114 minutes

Replace the w in the formula with 2.2.
20 × 2.2 = 44. 44 + 70 = 114, so Jack needs to cook his turkey for 114 minutes.

25. 47 minutes

The mean is the total of all the values divided by 5. You can do the opposite of this calculation to find the total of all the values: total of all the values = the mean × 5 = 42 × 5 = 210. The total of the values so far is 31 + 36 + 44 + 52 = 163.
So the missing value must be 210 − 163 = 47

26. £1.10

To calculate the mean, add up the amounts and divide by the number of months (6):
£1.20 + £0.80 + £1.50 + £1.10 + £1.50 + £0.50 = £6.60 (Remember to convert 80p to £0.80 and 50p to £0.50.)
Now divide the total by 6: £6.60 ÷ 6 = £1.10

27. £23.96

The area of the soil is 8 × 6 = 48 m².
One tub of seed covers 12 m², so 48 ÷ 12 = 4 tubs are needed.
This costs £5.99 × 4 = (£6.00 × 4) − 4p
= £24.00 − 4p = £23.96

28. 14 g

20 g is two thirds of 30 g. If there are 21 g of carbohydrate in 30 g of cereal, there will be two thirds of 21 g in 20 g of cereal.
One third of 21 g = 21 ÷ 3 = 7 g
Two thirds of 21 g = 7 × 2 = 14 g

29. 75 g

1 serving of the breakfast cereal has 0.8 g of fibre, so 2 servings has 0.8 × 2 = 1.6 g. You still need 0.4 g of fibre to get up to 2 g, so you need another half a serving. Altogether you need 2 and a half servings: 2.5 × 30 = 75 g

30. D

You can work out 1% by doing 30 ÷ 100 = 0.3 g.
Then divide the amount of fat (1.5 g) by 0.3 g to find the percentage of fat: 1.5 g ÷ 0.3 g = 5% (as 15 ÷ 3 = 5 and both numbers are ten times smaller), so the answer is D.