

Assessment Test 2

Pages 49-54

- 1) **D**
There are 8 segments and 3 are shaded. This is the fraction $\frac{3}{8}$.
- 2) **A**
A small can of beans weighs around 250 g.
All of the other weights are either too small or too large.
- 3) **A**
You can work out the area of a rectangle by length \times width.
So, the area of the flag is $6 \times 4 = 24 \text{ cm}^2$. The flag is split into 4 equal rectangles, so the area of the shaded rectangle is $24 \div 4 = 6 \text{ cm}^2$.
- 4) **34 minutes**
The fastest time was 156 minutes and the slowest time was 122 minutes. $156 - 122 = 34$.
- 5) **B**
You need to find the piece that is the right size to fit in the gap.
Shape B has been rotated by 180° but is the only shape that can fit in the gap.
- 6) **(-1, 2)**
Four squares north takes Adam to $(-3, 2)$. Two squares east takes him to his finishing point at $(-1, 2)$.
- 7) **B**
 212 is 21×21 . You can estimate the answer by rounding the numbers to the nearest 10 and working out 20×20 .
 $20 \times 20 = 400$. The only realistic option is B — 441.
- 8) **27**
63 cars is 9 lots of 7 cars. Out of each 7 cars, Caley can expect 3 to be red. This means she can expect $9 \times 3 = 27$ cars to be red.
- 9) **A**
The difference between 45.6 and 45.9 is $45.9 - 45.6 = 0.3$.
 $0.3 \div 2 = 0.15$ so the halfway point between the two numbers will be $45.6 + 0.15 = 45.75$.
- 10) **6**
Dogs have $2\frac{1}{2}$ symbols and fish have 1 symbol so the difference between them is $1\frac{1}{2}$ symbols. Each symbol in the pictogram is equal to 4 people. So, half of a symbol is $4 \div 2 = 2$ people.
 $1\frac{1}{2}$ symbols is equal to 4 people + 2 people = 6 people.
- 11) **D**
90 can be divided by 2 because 90 is an even number. The digits in 90 add up to a multiple of 3 ($9 + 0 = 9$) so it can be divided by 3. If a number ends in a 5 or 0 it can be divided by 5, so 90 can be divided by 5. $9 \times 10 = 90$ so 90 can be divided by 9. That leaves 7 — 90 can't be divided by 7.
- 12) **3 pm**
The graph shows a rise in temperature until 3 pm when it starts to drop again. This is when he went outside and left the door open.
- 13) **C**
Add the prices of the sets of three board games together.
You need to find the option that adds up to £29.50 ($£30.00 - £0.50 = £29.50$). This is easiest if you split the numbers and add the pounds and pence separately.
 $£12.50$ (Blocks) + $£6.50$ (Clueless) + $£10.50$ (Trivia Time)
 $= (£12 + £10 + £6) + (£0.50 + £0.50 + £0.50)$
 $= £28 + £1.50 = £29.50$.
- 14) **B**
For B, the dial is split into 8 parts and 1 kg is at the 4th point, halfway round the scale. This means that each point on the scale represents $1 \text{ kg} \div 4 = 250 \text{ g}$. As the arrow is pointing at the 3rd point, it is pointing at $3 \times 250 \text{ g} = 750 \text{ g}$.

15) **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.

16) **68%**

To find a percentage you need to get a fraction out of 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 $\frac{32}{100}$. $\frac{32}{100} = 32\%$.

The percentage of people who didn't have a blue car is $100 - 32 = 68\%$.

17) **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.

18) **C**

To find the length of 20 scarves you need to multiply 45 cm by 20. $45 \times 20 = 900 \text{ cm}$.

There are 100 cm in 1 m, so $900 \text{ cm} = 9 \text{ m}$.

19) **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:

$$32 - 5 - 4 - 8 - 6 = 9.$$

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 $\frac{1}{4} = 25\%$ ($25\% \times 4 = 100\%$).

21) **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 $60 + 60 = 120^\circ$.

22) **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 $4 \times 50\text{p} = £2$. She bought 7 bags of peanuts so the approximate price of these is $7 \times 30\text{p} = £2.10$.

$£2 + £2.10 = £4.10$. 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: $£4.10 - 11\text{p} = £3.99$.

23) **30%**

There are 10 results in the list, and 3 of these are red.

So $\frac{3}{10}$ of the children chose red as their favourite colour.

As a percentage, this is 30%.

24) **50 cm²**

The area of each square is length \times width = $4 \times 4 = 16 \text{ cm}^2$.

The area of $\frac{1}{2}$ a square = $16 \div 2 = 8 \text{ cm}^2$.

1 whole square + 3 halves = $16 + 8 + 8 + 8 = 40 \text{ cm}^2$.

She uses $\frac{1}{2}$ of a circle for the base and $\frac{1}{2}$ of a circle for the nose, so 1 circle in total. The total area of the circle is 10 cm^2 .

So, the total area is $40 + 10 = 50 \text{ cm}^2$.

25) **B**

Elsa has $7 + 8 + 3 = 18$ sweets to start with. She eats 2 chocolate drops so there are 16 sweets left ($18 - 2 = 16$).

There are still 8 toffees left, so the fraction of toffees is $\frac{8}{16}$. $\frac{8}{16} = \frac{1}{2}$.

26) **D**

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.

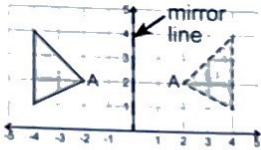
The journey on Bus A is longer, so the longest time is 72 minutes.

27) **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 $0.025 \times 2 = 0.05 \text{ m}$ in a year. $0.5 \text{ m} \div 0.05 \text{ m} = 10$, so it'll take the plant 10 years to grow 0.5 m.

28) E

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



29) B

$3 \times 44 = 132$ which is an even number so option B is incorrect.

All of the other statements are true.

30) 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).

31) D

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

32) 136°

A kite is a quadrilateral so the angles in a kite add up 360° .

This means that the angle next to angle a is

$360 - 130 - 130 - 56 = 44^\circ$. Angles on a straight line add up to 180° , so angle a is $180 - 44 = 136^\circ$.

33) D

46 is 23 doubled, so 46×14 will be 23×14 doubled.

So $46 \times 14 = 322 \times 2 = 644$. 140 is 10 times larger than 14, so $46 \times 140 = 644 \times 10 = 6440$.

34) £16.00

The cost of tickets for 2 adults and 2 children is $\text{£}3.50 + \text{£}3.50 + \text{£}1.50 + \text{£}1.50 = \text{£}10.00$. A family ticket is 20% cheaper — 10% of $\text{£}10$ is $\text{£}1$ so 20% is $\text{£}2$. So a family ticket is $\text{£}10 - \text{£}2 = \text{£}8$. Raj is buying two family tickets so the total cost is $8 \times 2 = \text{£}16$.

35) D

Look at each statement and decide if it's true:

A: $\frac{3}{4} = \frac{75}{100}$, so $\frac{7}{100}$ is not greater than $\frac{3}{4}$.

B: $\frac{7}{100} = 0.07$, so $\frac{7}{100}$ is not greater than 0.65.

C: $\frac{7}{100} = 0.07$, so $\frac{7}{100}$ is not greater than 0.09.

D: $\frac{3}{4} = 0.75$, so 0.65 is less than $\frac{3}{4}$.

E: 0.65 is greater than 0.09.

36) 1:3

He saw 3 times as many electric trains as diesel trains.

So the ratio of diesel trains:electric trains is 1:3.

37) 160

The number of matchboxes that can fit along the length of the packing box is $10 \div 2 = 5$. The number that can fit across the width is $8 \div 2 = 4$ and the number that can fit up the height is $8 \div 1 = 8$. So, the total number of matchboxes that can fit in the packing box is $5 \times 4 \times 8 = 20 \times 8 = 160$.

38) B

Start by making sure everything is in the same units — there were 4 litres of water, so change this to millilitres by multiplying by 1000: $4 \times 1000 = 4000$ ml. There are 5 holes each losing 80 ml each hour, so the amount of water being lost each hour is $5 \times 80 = 400$ ml. Divide the total volume of water (4000) by the amount being lost each hour (400) to find the number of hours it'll take to empty: $4000 \div 400 = 10$ hours.

39) 6.5 m

The vertical sides of the shape measure $1 + 3 + 4 = 8$ m. So, the total of the horizontal sides of the shape is $21 - 8 = 13$ m. As the shape is a rectangle, the bottom side is half of this, so the length of X (the bottom) is $13 \div 2 = 6.5$ m.

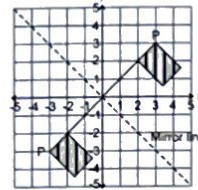
40) B

n is the number of the term. To find the first term, substitute 1 for n (remember to follow BODMAS).

$3 \times 12 + 1 = 3 \times 1 + 1 = 3 + 1 = 4$. To find the second term, n is 2: $3 \times 22 + 1 = 3 \times 4 + 1 = 12 + 1 = 13$.

41) (-3, -3)

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

42) 12 cm^3

The volume of each cube of cheese is $2 \times 2 \times 2 = 8 \text{ cm}^3$.

There are 3 cubes of cheese, so the total volume of cheese is $8 \times 3 = 24 \text{ cm}^3$. The mouse eats 12 cm^3 of cheese, so the amount left is $24 - 12 = 12 \text{ cm}^3$.

43) B

The cactus plants come in boxes of 12 and Lemone needs 60 plants so she needs $60 \div 12 = 5$ 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 $S + 5C$.

44) 2

The total angle around the point at the centre of the spinner is 360° and there are 8 segments, so the size of each segment is $360 \div 8 = 45^\circ$. $360 - 45 = 315^\circ$ 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.

45) D

n is the number of the term. Test each expression by substituting n with at least 3 different values. Eg 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 expression.

46) 91

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

47) D

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

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

48) 5

The number of sausage rolls eaten by the children is $22 \times 3 = 66$ and the number eaten by the adults is $7 \times 5 = 35$. So the total number of sausage rolls eaten is $66 + 35 = 101$. The sausage rolls come in packets of 25. $4 \times 25 = 100$ so Sherrie will need to buy 5 packets to have 101 sausage rolls.

49) B

The area of each tile is 0.04 m^2 and Moses uses 100 tiles to cover the floor, so the total area of the bathroom is $100 \times 0.04 = 4 \text{ m}^2$.

The area of the bathroom is calculated using length \times width, so $\text{area} \div \text{width} = \text{length}$: $4 \div 1 = 4$ m.

50) D

$3(x + 6y)$ means: $x + 6y + x + 6y + x + 6y = 3x + 18y$.

Assessment Test 3

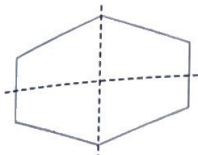
Pages 55-60

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 $5 \times 1 \text{ cm}^2 = 5 \text{ cm}^2$, and 3 half squares with an area of $3 \times 0.5 \text{ cm}^2 = 1.5 \text{ cm}^2$, so the total area is $5 + 1.5 = 6.5 \text{ cm}^2$.

2) **B**

There are two lines of symmetry:



3) **C**

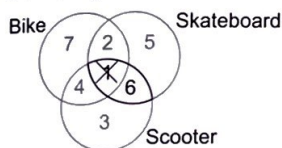
Litres is not a unit of length. Centimetres and millimetres are too small. Kilometres are too big. So metres is the most suitable unit.

4) **7**

Each rectangle represents 4 vehicles, so $\frac{1}{4}$ of a rectangle represents 1 vehicle. There are $1\frac{3}{4}$ rectangles for the buses. This is equivalent to 4 buses for the whole rectangle and 3 buses for the $\frac{3}{4}$ rectangle. $3 + 4 = 7$ buses.

5) **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.



6) **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) $£5.00 - £1.64 = £3.36$.

7) **A**

To convert from the 24-hour clock to the 12-hour clock subtract 12 from the hours, in this case, 13. $13 - 12 = 1$. In the 24 hour clock, if the number of hours is greater than 12, the time is pm. So the answer is 1:45 pm.

8) **6:05 pm**

$1\frac{3}{4}$ 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, $1\frac{3}{4}$ hours is 15 minutes less than 2 hours. So you could add on 2 hours and then subtract 15 minutes.

9) **D**

It is difficult to divide 9.45 by 1.5, so round it down to 9. There are 6×1.5 in 9, so the answer must be about 6 — D is the only possible answer.

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) **113**

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

$$\text{Year 3: } 49 + 50 = 99$$

$$\text{Year 4: } 52 + 56 = 108$$

$$\text{Year 5: } 55 + 57 = 112$$

$$\text{Year 6: } 54 + 59 = 113$$

$$\text{Year 7: } 10 + 20 = 30$$

Year 6 is the biggest year group and has 113 children.

12) **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.

13) **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 $90 \times 0.08 = 7200 \div 1000 = 7.2$

14) **11**

1.75 pints = 1 litre, so 6 litres = 1.75 pints $\times 6$. Split the calculation up to make it easier. 2 litres = $2 \times 1.75 = 3.5$ pints.

6 litres = 3×2 litres, so 6 litres = $3.5 \times 3 = 10.5$ pints.

So you'd need 11 bottles.

15) **E**

E (a trapezium) is the only shape with one pair of parallel sides (the top and bottom). A and D have more than one pair of parallel sides. B and C have no parallel sides.

16) **B**

The pattern is made up of a set of three shapes that repeat.

$3 \times 6 = 18$, 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.

17) **Ian**

The fastest time is the smallest number. Cara was fastest with a time of 3 mins 59 secs. Ian came second with a time of 4 mins 2 secs.

18) **B**

Ian has rounded each item up by 1p.

There are 9 items, so his estimate will be 9p too much.

19) **E**

42 is half of 84, so 349×42 will be half of 29 316. 29 316 is just under 30 000, so the answer should be just under half of this, around 15 000. Option E is the only possible option.

20) **A**

The prime numbers shown on the dice are 2, 3, and 5.

This is 3 out of the 6 numbers, so the fraction must be $\frac{3}{6} = \frac{1}{2}$.

21) **B**

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

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

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

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:

$$\frac{3}{20}, \frac{1}{5}, \frac{5}{20}, \frac{7}{20}, \frac{3}{4}$$

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.

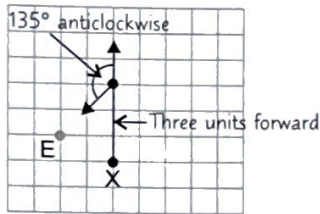
23) 597 miles

If Sue can travel 2985 miles on 5 tanks, she can travel
 $2985 \div 5$ miles on 1 tank:

$$\begin{array}{r} 597 \\ 5 \overline{)2985} \end{array}$$

24) E

The map below shows Jenny's movements. Remember 90° is a right angle, so 135° is one and a half right angles ($90^\circ + 45^\circ$).

**25) 6**

Two different numbers are multiplied by 56, then added together to make 560. 560 is the same as 56×10 . You already know that part of the calculation is 4×56 , so to get 560 the other part must be 6×56 ($6 + 4 = 10$).
 $(4 \times 56) + (6 \times 56) = 10 \times 56 = 560$.

26) E

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.

27) 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 — which must mean that the number was 121 ($112 + 9 = 121$). To reach 121 the original number was multiplied by 11. So you need to divide 121 by 11 to find the original number: $121 \div 11 = 11$.

28) 14

To calculate the mean, add all numbers together and divide by the number of classes (6).
 $\text{Mean} = (16 + 16 + 11 + 17 + 12 + 12) \div 6 = 84 \div 6 = 14$

29) 52 m²

First find the area of the whole garden, then subtract the area of the flower bed. This gives you the lawn area.

$$\begin{aligned} \text{Garden} &= 8 \times 8 = 64 \text{ m}^2 \\ \text{Flower bed} &= 4 \times 3 = 12 \text{ m}^2 \\ \text{Lawn} &= 64 - 12 = 52 \text{ m}^2 \end{aligned}$$

30) 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)

31) 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. $10\% \text{ of } 30 = 30 \div 10 = 3$ so $70\% = 7 \times 10\% = 7 \times 3 = 21$. There must be $30 - 21 = 9$ girls. So there are $21 - 9 = 12$ more boys than girls.

32) 2 km

Sarah runs on $7 \times 12 = 84$ days
 Each day she runs $168 \div 84 = 2$ km.

33) 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.

34) 210

The calculation is easier if you recognise that $11 + 12 + 13 + 14 + 15 + 16 + 17 + 18 + 19 + 20$ is the same as $(1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10) + (10 \times 10)$. So the total = $55 + 55 + 100 = 210$

35) 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 $7 \times 3 = 21$ more squares than Shape 4. This means it has $10 + 21 = 31$ in total.

36) B

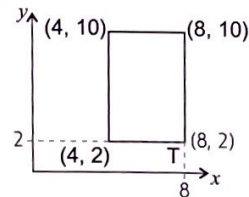
There are 1000 ml in 1 litre, so in 10 litres, there are 10 000 ml. $\frac{2}{5}$ of a litre = $\frac{2}{5} \times 1000 \text{ ml} = (1000 \times 2) \div 5 = 2000 \div 5 = 400 \text{ ml}$. So the amount left in the bucket = $10\ 000 - 400 = 9600 \text{ ml}$

37) 80 cm²

Find the side lengths of the enlarged rectangle by multiplying the old lengths by the scale factor: $2 \times 2 = 4 \text{ cm}$, $2 \times 10 = 20 \text{ cm}$. Then multiply the side lengths to find the area: $4 \times 20 = 80 \text{ cm}^2$.

38) (8, 2)

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

**39) 2016**

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

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

40) 30 cm³

The area of the triangular side
 $= \frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 3 \times 2 = 3 \text{ cm}^2$.
 Volume = area of triangular side \times length = $3 \times 10 = 30 \text{ cm}^3$

41) B

Add the numbers together and divide by 2 to find the value half way between them. $4.19 + 3.81 = 8$. $8 \div 2 = 4$.

42) 48 cm

The perimeter of a rectangle is made up of 2 lengths and 2 widths.
 So $1 \text{ length} + 1 \text{ width} = \text{half the perimeter} = 128 \div 2 = 64 \text{ cm}$.
 The length is 3 times as long as the width so the width $\times 4 = 64 \text{ cm}$.
 So the width is $64 \div 4 = 16 \text{ cm}$. Multiply the width by 3 to find the length: $16 \times 3 = 48 \text{ cm}$.

43) 3

Read off how many $^{\circ}\text{C}$ 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.

44) D

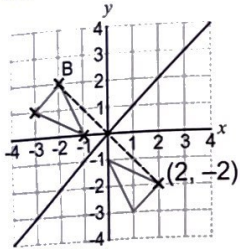
Add up the 4 given ages: $6 + 3 + 8 + 2 = 19$.
 The mean age of all 6 babies is 5 months, so the total must be $6 \times 5 = 30$ months.
 This means the ages of the other 2 babies must add up to $30 - 19 = 11$ months.
 This means that the correct answer must be D.

45) 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 $10.5 \times 360^{\circ} = 3780^{\circ}$.

46) (2, -2)

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

**47) £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.

48) B

The whole pie chart represents 20 days. If $20 \text{ days} = 360^{\circ}$, then $1 \text{ day} = 360 \div 20 = 18^{\circ}$. 3 foggy days will be represented by an angle of $3 \times 18^{\circ} = 54^{\circ}$.

49) £9.75

Find 30% of £2.50: $10\% \text{ of } £2.50 = £0.25$

$$30\% = 3 \times 10\% = £0.25 \times 3 = £0.75$$

So if he cleans the car one week he gets $£2.50 + £0.75 = £3.25$

If he does this for 3 weeks, he gets $£3.25 \times 3 = £9.75$

50) D

1 game costs £39.99, so n games will cost him

$$n \times 39.99 = 39.99n$$

The computer cost £260.

Subtract these amounts from £500 to find what he has left over:

$$500 - 260 - 39.99n = 240 - 39.99n$$

Assessment Test 4

Pages 61-66

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) Monday**

-2°C is the lowest temperature in the table.

5) 1 hour 20 mins

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 from 7:55 pm to 8:15 pm which is 20 more minutes, making a total of 1 hour 20 minutes.

6) 17.5 cm²

The area of a rectangle is length \times width. So, the area is 7×2.5 .

Partition 2.5 into 2 and 0.5 and multiply each number by 7.

$$7 \times 2 = 14. \quad 7 \times 0.5 = 3.5. \quad \text{So } 7 \times 2.5 = 14 + 3.5 = 17.5 \text{ cm}^2.$$

7) 0.18

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) E

She starts at (4, 3) so one unit east takes her to (5, 3).

Two units south take her to (5, 1). So, she ends up at point E.

9) 8:30 am

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

10) 41

The frequency just shows how many times each number has been rolled. 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

You can find the answer by rounding the prices of the bunches of flowers. The cost of three bunches at £1.49, is slightly less than $£1.50 \times 3 = £4.50$. The other bunch costs £1.99, which rounds to £2. So the total cost is about $£4.50 + £2 = £6.50$. You've rounded up each time, so the actual cost will be slightly less than £6.50, so answer B (£6.46) is the only possible choice.

12) E

Compare the angle to a right angle.

It is approximately half of a right angle. $90^{\circ} \div 2 = 45^{\circ}$.

13) C

There are 8 spaces on the scale between 0 and 4 kg. So each space is worth $4 \div 8 = 0.5 \text{ kg}$. The arrow is half a space further along than 2 kg on the scale. Half of $0.5 \text{ kg} = 0.25 \text{ kg}$.

So the kitten weighs $2 \text{ kg} + 0.25 \text{ kg} = 2.25 \text{ kg}$

14) 8 cm

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

15) 3.750 kg

First find the mass of each type of fruit:

Oranges: $600 \times 1 = 600$ g

Bananas: $450 \times 2 = 900$ g

Apples: $500 \times 3 = 1500$ g

Pears: $750 \times 1 = 750$ g

Add up all the masses:

$600 + 900 = 1500$ g

$1500 + 1500 = 3000$ g

$3000 + 750 = 3750$ g

Convert the grams to kilograms:

1000 g = 1 kg, so 3750 g = 3.750 kg

16) B

If he had one loaf and ate an equal amount each day, he'd eat $\frac{1}{7}$ of a loaf. He has three loaves, so he eats three times more each day. $3 \times \frac{1}{7} = \frac{3}{7}$.

17) E

The dogs' area of the pie chart is slightly bigger than a quarter of the chart. Calculate a quarter of the 32 pets: $32 \div 4 = 8$. 9 is one more than 8. The other choices are too big or too small to be reasonable estimates.

18) B

9 is greater than 5, so 39 rounds up to 40. 3 is less than 5, so 43 rounds down to 40. $40 \times 40 = 1600$.

19) 35

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

20) D

Convert prices in £ to pence, then divide the price by the number of cakes.

A 15p each

B $39p \div 3 = 13p$ each

C $100p \div 10 = 10p$ each

D $200p \div 25 = 8p$ each

E $150p \div 15 = 10p$ each

8p is the lowest price per cake.

21) E

All the answer choices are really different in this question, so you can just use estimation to quickly work out roughly how big the answer is. The mass of apples needs to be just over double the mass of sugar. So for 9 kg of sugar you'll need a bit more than 18 kg of apples. The only possible answer is 20.25 kg. Alternatively, round 9 kg to 10 kg. You need 2.25 kg of apples for every 1 kg of sugar, so for 10 kg of sugar you need roughly $10 \times 2.25 = 22.5$ kg. You rounded up, so you know that the answer is a bit less than 22.5 kg. Again 20.25 kg is the only possibility.

22) 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 = $21 \div 3 = 7$ g

Two thirds of 21 g = $7 \times 2 = 14$ g

23) 144

Each piece is $\frac{1}{3}$ m, so each metre of ribbon will make 3 pieces. There is 48 m of ribbon, so the total number of pieces = 3×48 . You can calculate this by partitioning 48: $(3 \times 40) + (3 \times 8) = 120 + 24 = 144$. You could also round 48 m to 50 m and calculate $3 \times 50 = 150$. You added 2 m extra when rounding, so there are $3 \times 2 = 6$ too many pieces. Total number of pieces = $150 - 6 = 144$.

24) B

Triangle-based pyramids have 4 triangular faces, 4 vertices and 6 edges.

**25) £3919**

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

26) A

The horizontal line on the graph shows no distance was travelled between 09:00 and 10:30, which is $1\frac{1}{2}$ hours. (Read the times off the horizontal axis.) This was when they were having a break.

27) E

403 is half of 806. So 30×403 must be equal to half of 30×806 . As $30 \times 806 = 24\,180$, 30×403 must be $24\,180 \div 2 = 12\,090$.

28) 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 = $\frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 5 \times 4 = 2.5 \times 4 = 10$ m².

The area of each triangle is about 10 m², so the area of the patio is about $2 \times 10 = 20$ m². The only answer that is possible is 19.2 m².

29) 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. $6000 \div 30 = 200$.

30) Beef and Prawn Cocktail

According to the bar chart, 25 children said Ready Salted. Now find two other flavours for which the numbers of children add up to 25. 11 children said Beef, and 14 said Prawn Cocktail ($11 + 14 = 25$). This is the only pair which add to 25.

31) 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

32) 10

$250 \div 12 = 20$ remainder 10. $12 \times 10 = 120$,

so $12 \times 20 = 240$. $250 - 240 = 10$. 10 is less than 12, so no more bags can be filled. So 10 biscuits are left over.

33) 1:2

The ratio of cherry sweets:lime sweets is 5:10.

In its simplest form, this is 1:2.

(You simplify ratios by dividing the both sides by the same number — in this case 5.)

34) 194

Write down the square numbers between 46 and 91:

$6 \times 6 = 36$ — too small, $7 \times 7 = 49$, $8 \times 8 = 64$, $9 \times 9 = 81$,
 $10 \times 10 = 100$ — too big. $49 + 64 + 91 = 194$.

35) 5

Each symbol is worth 3 awards, so the three full circles on Wednesday represent $3 \times 3 = 9$ awards. The four full circles on Thursday represent $4 \times 3 = 12$ awards, and the two-thirds of a circle represents 2 awards, giving a total of $12 + 2 = 14$. So the difference is $14 - 9 = 5$ awards.

36) 30%

There are $6 + 3 + 4 + 7 = 20$ balls altogether, and 6 of these have a pattern of yellow spots.

So $\frac{6}{20}$ or $\frac{3}{10}$ balls have a pattern of yellow spots.

As a percentage, this is 30%.

37) £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 8Op to £0.80 and 5Op to £0.50.)

Now divide the total by 6: $£6.60 \div 6 = £1.10$

38) 64 cm

The shape he draws is a rectangle. The rectangle is the same length as seven cubes ($7 \times 4 = 28$ cm).

The rectangle is as wide as one cube (4 cm).

So the perimeter is $28 + 28 + 4 + 4 = 64$ cm.

39) 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 .

40) B

The dog eats 245 g each meal, and she has $3 \times 7 = 21$ meals a week.

So in one week, she eats $245 \text{ g} \times 21$. 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.

$$250 \times 20 = 5000 \text{ g} = 5 \text{ kg.}$$

The only answer close to 5 kg is 5.145 kg.

41) £280

First work out how many hours a day the café is open for in the summer and in the winter. Mar – Sep: 9 am to 6 pm = 9 hours.

Oct – Feb: 11 am to 4 pm = 5 hours. So the café is open

4 hours ($9 - 5$) more each day in the summer.

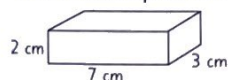
So it's open $4 \times 7 = 28$ hours longer per week in the summer.

It costs £10 per hour to run the café, so it costs

$$28 \times £10 = £280 \text{ more each week in the summer.}$$

42) 42 cm³

The net folds up to form a cuboid:



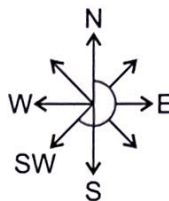
$$\text{Volume} = \text{length} \times \text{width} \times \text{height} = 7 \times 3 \times 2 = 42 \text{ cm}^3$$

43) 1100 ml

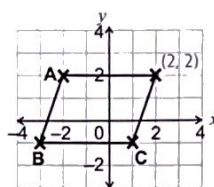
First work out how many ml of milk Katie drinks each day: 350 ml twice a day = $350 \times 2 = 700$ ml. Now find out how much milk she drinks a week. $700 \times 7 = 4900$ ml. She starts with 6 litres of milk, which is 6000 ml. So at the end of the week, she has $6000 - 4900 = 1100$ ml left.

44) B

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

**45) (2, 2)**

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

**46) 8**

49 is a square number — $7^2 = 49$. 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.

47) 35

Use inverses to work back from 25. To find the number divided by 7 to get 25, multiply 25 by 7: $25 \times 7 = 175$. To find the number that is multiplied by 5 to get 175, divide 175 by 5:

$$175 \div 5 = 35.$$

48) C

Make a table of the values and their positions in the pattern:

| | | | | | |
|-------|----|---|---|---|---|
| n | 1 | 2 | 3 | 4 | 5 |
| value | -1 | 1 | 3 | 5 | 7 |

You might be able to spot the pattern — you double n and subtract 3 to get the value. This means the formula is $2n - 3$.

If you don't spot this pattern, just 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: $3n = 3 \times 2 = 6$ — not correct

B: $n - 3 = 2 - 3 = -1$ — not correct

C: $2n - 3 = 2 \times 2 - 3 = 1$ — correct

D: $2 \div n - 3 = 2 \div 2 - 3 = -2$ — not correct

E: $2n + 3 = 2 \times 2 + 3 = 7$ — not correct

Only C gives the correct value, so must be the formula.

49) £23.96

The area of the soil is $8 \times 6 = 48 \text{ m}^2$.

One tub of seed covers 12 m^2 , so $48 \div 12 = 4$ tubs are needed.

This costs $£5.99 \times 4 = £23.96$.

50) B

60% percent of an amount is $\frac{60}{100} = \frac{6}{10} = \frac{3}{5}$ of it.

If the price of an item is reduced by $\frac{3}{5}$ the new price

will be $1 - \frac{3}{5} = \frac{2}{5}$ of it. So, if the amount is n ,

the sale price will be $\frac{2}{5}(n)$.