

Mock Set B – Paper 2

Solutions

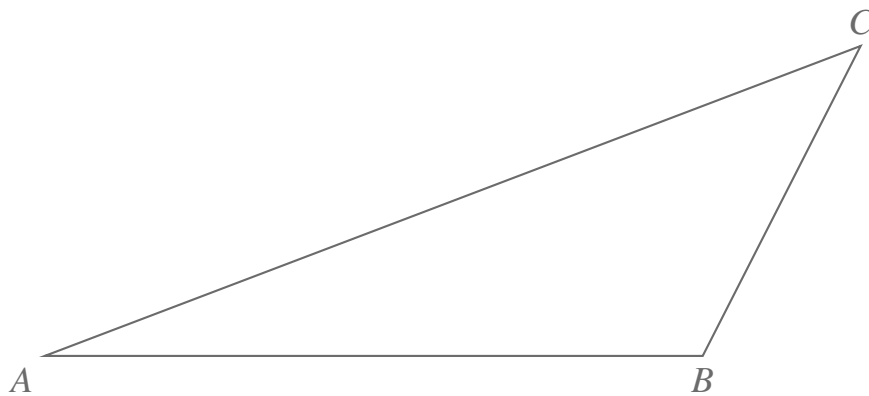
For AQA GCSE Mathematics (8300)

Foundation tier • Paper 2 (Calculator)

Each question is shown in grey, followed by the working, one step per line. The final answer is in a box. *Marks* shows how the marks are usually given in the exam, and **Tip** points out a common mistake.

1 (2 marks)

Here is an accurate drawing of triangle ABC .



- (a) Measure the length of AB .
Give your answer in millimetres.

Put the 0 on the ruler exactly on A .

Read the ruler at B : 8.7 cm.

1 cm = 10 mm, so 8.7 cm = 87 mm.

Answer: 87 mm

Tip: Start from the 0 mark on the ruler, not the end of the ruler. The answer must be in mm, so 8.7 is not enough.

- (b) Measure the size of angle ABC .

Angle ABC is the angle at B , between BA and BC .

It is bigger than a right angle, so it is obtuse.

Put the centre of the protractor on B and line up the zero line with BA .

Read the scale that starts at 0 on BA : 117°

Answer: 117°

Tip: Decide first if the angle is acute or obtuse. Angle ABC is obtuse, so 63° (from reading the wrong scale) cannot be right.

2 (3 marks)

- (a) Write 0.07 as a percentage.

To change a decimal to a percentage, multiply by 100

$$0.07 \times 100 = 7$$

Answer: 7%

Tip: 0.07 is 7 hundredths, so it is 7%, not 70%

- (b) Write $\frac{5}{8}$ as a decimal.

A fraction is a division: $5 \div 8$

$$5 \div 8 = 0.625$$

Answer: 0.625

Tip: Divide the top by the bottom: $5 \div 8$, not $8 \div 5$

- (c) Write 28% as a fraction in its simplest form.

28% means 28 out of 100: $\frac{28}{100}$

Divide the top and bottom by 4: $\frac{28}{100} = \frac{7}{25}$

7 and 25 have no common factor (other than 1), so this is the simplest form.

Answer: $\frac{7}{25}$

Tip: "Simplest form" means divide the top and bottom by the highest common factor. $\frac{14}{50}$ is not fully simplified.

3 (2 marks)

- (a) Simplify $w + w + w + w + w$

There are 5 lots of w

$$w + w + w + w + w = 5w$$

Answer: $5w$

Tip: Adding w five times is $5w$. Do not write w^5 : that means $w \times w \times w \times w \times w$

- (b) Simplify $8k - 3 + 2k + 9$

Collect the k terms: $8k + 2k = 10k$

Collect the numbers: $-3 + 9 = 6$

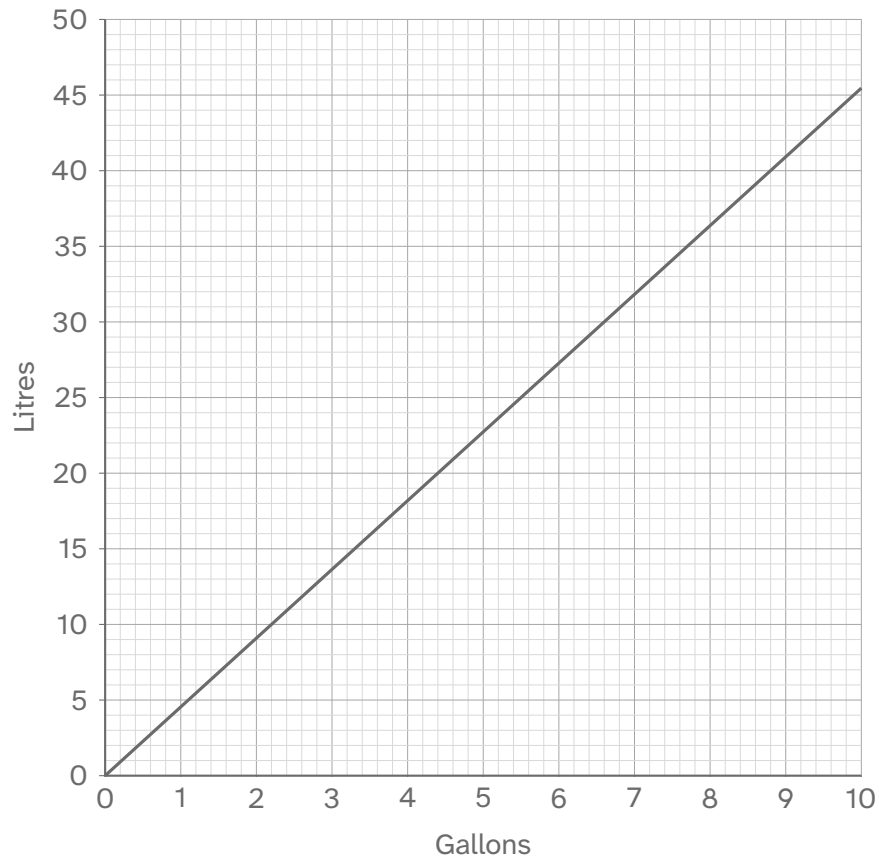
$$8k - 3 + 2k + 9 = 10k + 6$$

Answer: $10k + 6$

Tip: Keep each sign with the term after it: the 3 is -3 , so $-3 + 9 = 6$, not 12

4 (3 marks)

A petrol station uses this graph to convert between gallons and litres.



- (a) Use the graph to convert 25 litres to gallons.

Find 25 on the litres (vertical) axis.

Go across to the line, then down to the gallons axis.

25 litres is about 5.5 gallons.

Answer: 5.5 gallons

Tip: Litres are on the vertical axis here. Start from 25 on that axis, not on the gallons axis.

- (b) Finlay's van has a fuel tank that holds 16 gallons.

How many litres does the tank hold?

The graph only goes up to 10 gallons, so split 16 gallons into parts that are on the graph.

From the graph, 8 gallons is about 36.4 litres.

$16 = 2 \times 8$, so 16 gallons $\approx 2 \times 36.4 = 72.8$ litres.

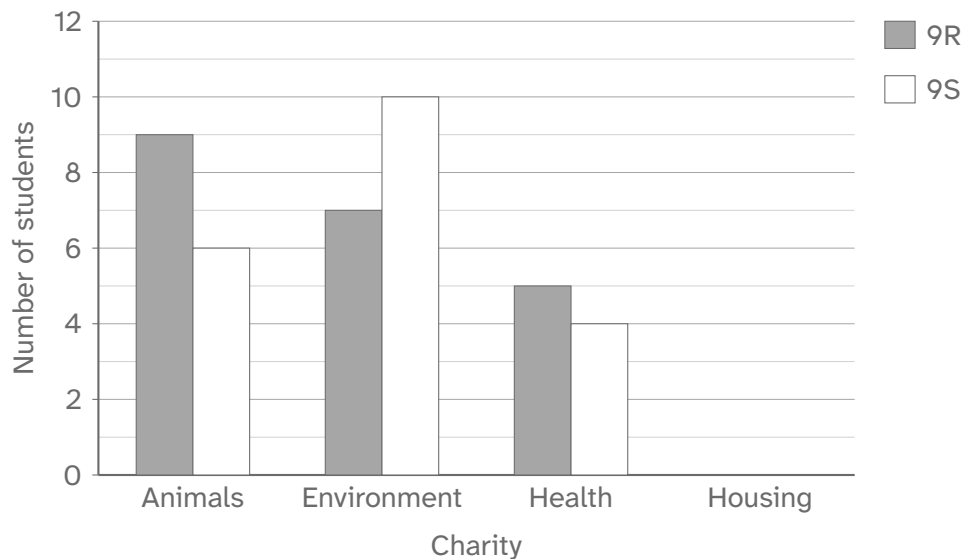
Answer: About 73 litres (accept 72 to 74)

Tip: Any method that adds up to 16 gallons works, e.g. $10 + 6$ or 4×4 . Read each value carefully: small errors are multiplied.

Marks: 1 mark for a correct method using values from the graph, e.g. $2 \times$ (the reading for 8 gallons), or 10 gallons + 6 gallons. 1 mark for an answer from 72 to 74.

5 (4 marks)

Each student in two tutor groups, 9R and 9S, voted for one charity.
The bar chart shows some of the results.



(a) How many more students in 9S than in 9R voted for Environment?

9S: 10 students. 9R: 7 students.

$$10 - 7 = 3$$

Answer: 3

Tip: Use the key: the white bars are 9S and the shaded bars are 9R.

- (b) 15 students in the two tutor groups voted for Housing. Twice as many students in 9R as in 9S voted for Housing. Complete the bar chart.

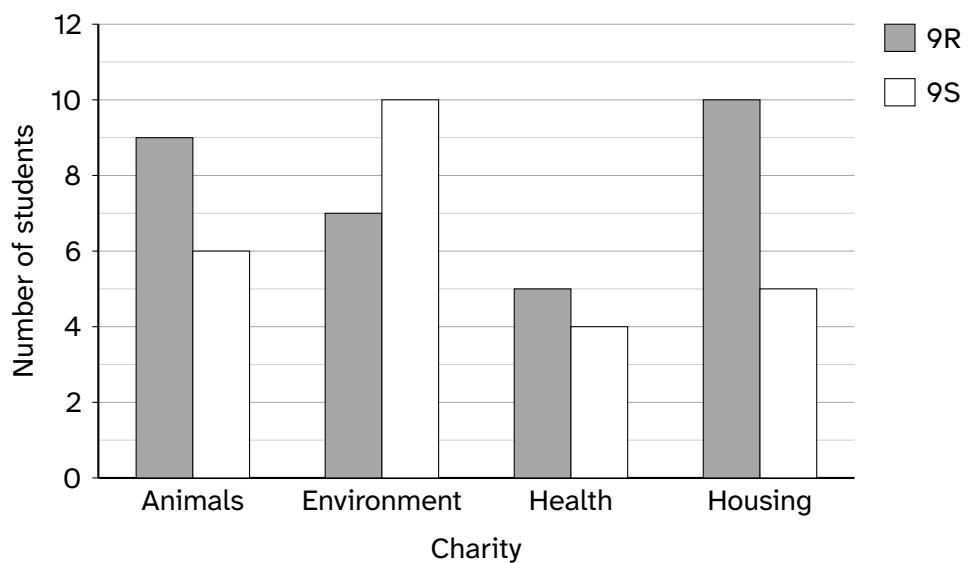
9R : 9S = 2:1, so there are $2 + 1 = 3$ parts.

One part: $15 \div 3 = 5$

9S: 5 students. 9R: $2 \times 5 = 10$ students.

Check: $10 + 5 = 15$ and 10 is twice 5 ✓

Draw a shaded bar of height 10 for 9R and a white bar of height 5 for 9S.



Answer: Housing: 9R bar to 10 (shaded), 9S bar to 5 (white)

Tip: “Twice as many” means 2 parts to 1 part, so divide by 3, not by 2

Marks: 1 mark for $15 \div 3$ (or 5 or 10 seen). 1 mark for 10 and 5. 1 mark for both bars drawn correctly, matching the key.

6 (2 marks)

Joe wants to work out $\frac{15 + 9}{3 \times 2}$. He types $15 + 9 \div 3 \times 2$ into his calculator and gets 21.
Joe says, “The answer is 21.” Is Joe correct?

The fraction line means work out the top and the bottom first.

Top: $15 + 9 = 24$. Bottom: $3 \times 2 = 6$

$$\frac{24}{6} = 4$$

Joe's calculator did the division and multiplication first: $15 + (9 \div 3 \times 2) = 15 + 6 = 21$

The correct answer is 4, so Joe is not correct.

☐ Yes ☒ No

Answer: No. The answer is $24 \div 6 = 4$. Joe needed brackets: $(15 + 9) \div (3 \times 2)$

Tip: When you type a fraction into a calculator, put brackets round the top and round the bottom, or use the fraction button.

Marks: 1 mark for $24 \div 6$ (or for 24 and 6). 1 mark for No with 4.

7 (3 marks)

Naomi and four friends have a meal at a restaurant.

The food and drinks cost £64.80

A service charge of 12.5% is added to the bill.

The five people share the total bill equally.

How much does each person pay?

Service charge: $12.5\% \text{ of } £64.80 = 0.125 \times 64.80 = £8.10$

Total bill: $£64.80 + £8.10 = £72.90$

Naomi and four friends is 5 people.

Each person pays $£72.90 \div 5 = £14.58$

Answer: £14.58

Tip: Read the people carefully: Naomi and four friends is 5 people, not 4. You can add 12.5% in one step with 64.80×1.125

Marks: 1 mark for the service charge (£8.10) or the total (£72.90). 1 mark for dividing by 5. 1 mark for £14.58.

8 (3 marks)

Seren's padlock has a three-digit code.
The code uses the digits 2, 7 and 9
Each digit is used once.

- (a) List all the possible codes.

Work systematically: fix the first digit, then swap the other two.

First digit 2: 279, 297

First digit 7: 729, 792

First digit 9: 927, 972

There are 6 possible codes.

Answer: 279, 297, 729, 792, 927, 972

Tip: Work in order: start with each digit in turn, so you do not miss a code or write one twice.

Marks: 2 marks for all six codes and no others. 1 mark for at least four correct codes.

- (b) Seren remembers that her code is greater than 750
How many of the possible codes are greater than 750?

From the list, the codes greater than 750 are 792, 927 and 972

729 is less than 750

Answer: 3

Tip: Check the codes starting with 7 carefully: 729 is less than 750, but 792 is more.

9 (4 marks)

The table shows the number of goals a hockey team scored in each match last season.

Number of goals	0	1	2	3	4
Number of matches	4	7	5	3	2

- (a) Work out the mean number of goals per match.
Give your answer to 1 decimal place.

Total number of matches: $4 + 7 + 5 + 3 + 2 = 21$

Total number of goals: $0 \times 4 + 1 \times 7 + 2 \times 5 + 3 \times 3 + 4 \times 2$

$= 0 + 7 + 10 + 9 + 8 = 34$

Mean $= 34 \div 21 = 1.619 \dots$

$= 1.6$ to 1 decimal place.

Answer: 1.6

Tip: Divide by the number of matches (21), not by the number of rows (5). Multiply each number of goals by its frequency first.

Marks: 1 mark for $34 \div 21$ (or for the total of 34 goals, divided by the number of matches).
1 mark for 1.6.

- (b) Hannah says, "The median number of goals is 2, because 2 is the middle number of goals in the table." Is Hannah correct?

There are 21 matches, so the median is the $\frac{21+1}{2} = 11$ th value.

The first 4 values are 0

The next 7 values are 1, so the 5th to 11th values are 1

So the 11th value is 1: the median is 1 goal.

Hannah is not correct. She found the middle of 0, 1, 2, 3, 4, not the middle match.

☐

Yes

✓ No

Answer: No. The median is the 11th value, which is 1 goal.

Tip: The median is the middle **match**, not the middle of the numbers 0 to 4. Use the frequencies to find the 11th match.

Marks: 1 mark for showing the median is the 11th value (or listing the values in order). 1 mark for No with a median of 1.

10 (4 marks)

Karim is paid £11.60 per hour for the first 7 hours each day and 1.5 times this rate for any time over 7 hours in a day. He works 5 hours on Friday, $9\frac{1}{2}$ hours on Saturday and 8 hours on Sunday. Work out his total pay.

Higher rate: $11.60 \times 1.5 = £17.40$ per hour

Friday: 5 hours, all at the normal rate.

Saturday: 7 hours normal and $9\frac{1}{2} - 7 = 2\frac{1}{2}$ hours at the higher rate.

Sunday: 7 hours normal and $8 - 7 = 1$ hour at the higher rate.

Normal hours: $5 + 7 + 7 = 19$ Higher-rate hours: $2.5 + 1 = 3.5$

Normal pay: $19 \times 11.60 = £220.40$

Higher-rate pay: $3.5 \times 17.40 = £60.90$

Total: $220.40 + 60.90 = £281.30$

Answer: £281.30

Tip: The 7 hours is **per day**. On Friday Karim works less than 7 hours, so none of Friday is at the higher rate. Do not take $7 \times 3 = 21$ hours away from the weekly total.

Marks: 1 mark for the higher rate (£17.40). 1 mark for 19 normal hours or 3.5 extra hours. 1 mark for a complete method for the total. 1 mark for £281.30.

11 (2 marks)

Work out the value of $2p^2 - 5q$ when $p = -3$ and $q = -4$

$$p^2 = (-3)^2 = 9, \text{ so } 2p^2 = 2 \times 9 = 18$$

$$5q = 5 \times (-4) = -20$$

$$2p^2 - 5q = 18 - (-20) = 18 + 20 = 38$$

Answer: 38

Tip: Square first, then multiply by 2: $2p^2$ is 2×9 , not $(2 \times -3)^2$. Subtracting -20 is the same as adding 20

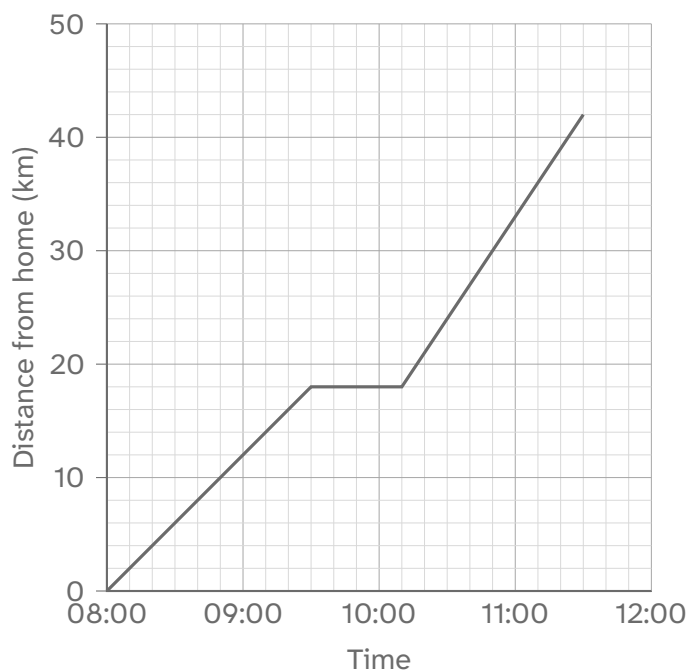
Marks: 1 mark for 18 or 20 (from -5×-4). 1 mark for 38.

12 (4 marks)

Olivia cycles from her home to a reservoir.

She stops for a rest on the way.

The distance-time graph shows her journey.



(a) How many minutes did Olivia stop for?

The horizontal part of the graph shows the stop.

It goes from 09:30 to 10:10

09:30 to 10:10 is 40 minutes.

Answer: 40 minutes

Tip: On the time axis each small square is 10 minutes, not 1 or 5 minutes. Six squares make one hour.

- (b) Work out Olivia's average speed after her stop.
Give your answer in km/h.

After the stop she goes from 18 km to 42 km: $42 - 18 = 24$ km.

She cycles from 10:10 to 11:30, which is 1 hour 20 minutes.

20 minutes = $\frac{20}{60} = \frac{1}{3}$ hour, so the time is $1\frac{1}{3}$ hours.

Speed = $\frac{\text{distance}}{\text{time}} = 24 \div 1\frac{1}{3} = 18$ km/h

Answer: 18 km/h

Tip: 1 hour 20 minutes is not 1.2 hours. Write it as $1\frac{1}{3}$ hours, or work out the km per minute and multiply by 60

Marks: 1 mark for 24 km divided by 1 hour 20 minutes in a correct form (e.g. $24 \div 80 \times 60$). 1 mark for 18.

- (c) Was Olivia cycling faster before her stop or after her stop? Give a reason for your answer.

Before the stop: 18 km in $1\frac{1}{2}$ hours, so $18 \div 1.5 = 12$ km/h.

After the stop: 18 km/h (part (b)).

The line after the stop is steeper, so she was faster after her stop.

☐ Before her stop ☒ After her stop

Answer: After her stop: the line is steeper (18 km/h compared with 12 km/h)

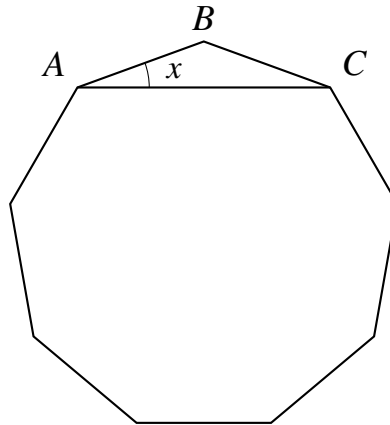
Tip: On a distance-time graph, the steeper the line, the faster the speed.

13 (3 marks)

A logo is in the shape of a regular nine-sided polygon.

A , B and C are three vertices of the polygon.

A straight line joins A to C .



Not drawn accurately

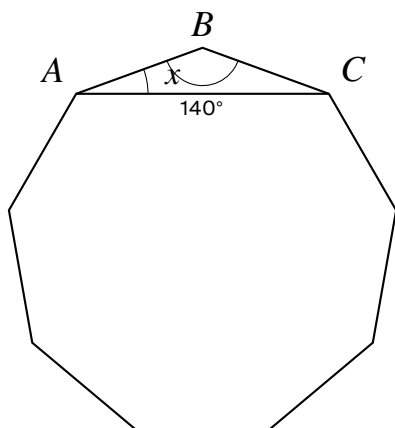
Work out the size of angle x .

Each exterior angle of a regular 9-sided polygon is $360 \div 9 = 40^\circ$

Each interior angle is $180 - 40 = 140^\circ$, so angle $ABC = 140^\circ$

$AB = BC$ (the sides of a regular polygon are equal), so triangle ABC is isosceles.

The two base angles are equal: $x = \frac{180 - 140}{2} = \frac{40}{2} = 20^\circ$



Answer: 20°

Tip: Angle x is not the interior angle of the polygon. Find the interior angle first, then use the isosceles triangle ABC

Marks: 1 mark for the interior angle (140°) or exterior angle (40°) method. 1 mark for $(180 - 140) \div 2$. 1 mark for 20.

14 (4 marks)

(a) Complete the table of values for $y = x^2 - x - 5$ for x from -2 to 4

$$x = -1: y = (-1)^2 - (-1) - 5 = 1 + 1 - 5 = -3$$

$$x = 4: y = 4^2 - 4 - 5 = 16 - 4 - 5 = 7$$

x	-2	-1	0	1	2	3	4
y	1	-3	-5	-5	-3	1	7

Answer: -3 (when $x = -1$) and 7 (when $x = 4$)

Tip: Use brackets for negative numbers: $(-1)^2 = 1$ and $-(-1) = +1$

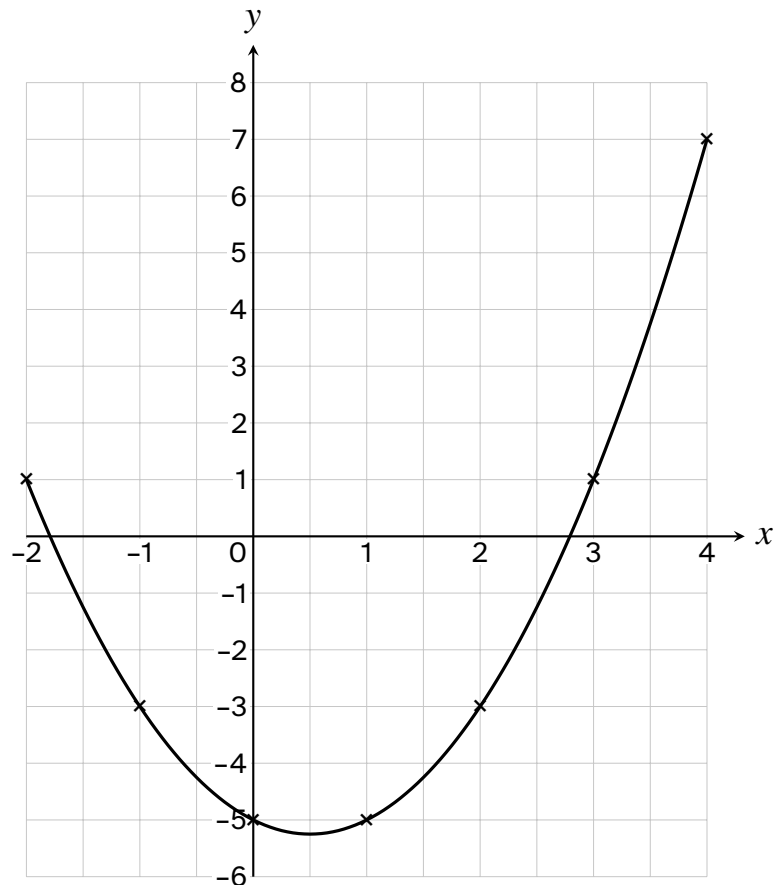
Marks: 1 mark for each correct value.

(b) Draw the graph of $y = x^2 - x - 5$ for values of x from -2 to 4

Plot the seven points from the table: $(-2, 1)$, $(-1, -3)$, $(0, -5)$, $(1, -5)$, $(2, -3)$, $(3, 1)$, $(4, 7)$

Join them with a smooth curve (not straight lines).

The bottom of the curve is between $x = 0$ and $x = 1$, a little below -5



Answer: Smooth U-shaped curve through $(-2, 1)$, $(-1, -3)$, $(0, -5)$, $(1, -5)$, $(2, -3)$, $(3, 1)$, $(4, 7)$

Tip: Do not join $(0, -5)$ and $(1, -5)$ with a flat line: the curve dips slightly below -5 between them.

Marks: 1 mark for plotting at least 6 points correctly. 1 mark for a smooth curve through all 7 correct points.

15 (2 marks)

Abdul uses his calculator to work out $\frac{487 \times 3.9}{21}$. His answer is 9.044. Use approximations to show that Abdul's answer must be wrong.

Round each number to 1 significant figure: $487 \approx 500$, $3.9 \approx 4$, $21 \approx 20$

Estimate: $\frac{500 \times 4}{20} = \frac{2000}{20} = 100$

The answer should be about 100, but Abdul's answer is about 9

So his answer must be wrong (it is about ten times too small).

Answer: $\frac{500 \times 4}{20} = 100$, which is much bigger than 9.044, so Abdul's answer is wrong.

Tip: In a "use approximations" question, show the rounded numbers and the estimate. Working out the exact answer on a calculator does not score.

Marks: 1 mark for rounding to suitable values (e.g. 500, 4 and 20). 1 mark for an estimate of 100 compared with 9.044.

16 (3 marks)

Mahnor runs an 8 km cross-country race.

Her time is 41 minutes 15 seconds.

Work out her average speed in km/h.

Give your answer to 1 decimal place.

15 seconds = $\frac{15}{60} = 0.25$ minutes, so the time is 41.25 minutes.

In hours: $41.25 \div 60 = 0.6875$ hours

Speed = $\frac{\text{distance}}{\text{time}} = \frac{8}{0.6875} = 11.636 \dots \text{ km/h}$

11.6 km/h to 1 decimal place.

Answer: 11.6 km/h

Tip: 41 minutes 15 seconds is 41.25 minutes, not 41.15 minutes. Change the time to hours before dividing, so the answer is in km/h.

Marks: 1 mark for changing the time correctly (41.25 minutes or 0.6875 hours). 1 mark for $8 \div$ time in hours (or $8 \div 41.25 \times 60$). 1 mark for 11.6.

17 (2 marks)

A sack of rice has a mass of 2.5×10^4 grams.

The mass of one grain of rice is 2.8×10^{-2} grams.

Work out the number of grains of rice in the sack.

Give your answer in standard form to 3 significant figures.

$$\text{Number of grains} = \frac{\text{total mass}}{\text{mass of one grain}} = \frac{2.5 \times 10^4}{2.8 \times 10^{-2}}$$

$$= 892\,857.1 \dots$$

To 3 significant figures: 893 000

In standard form: 8.93×10^5

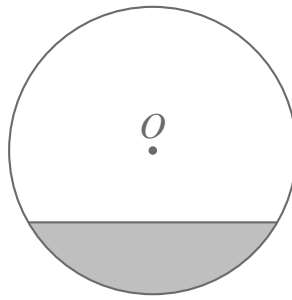
Answer: 8.93×10^5

Tip: Use the $\times 10^x$ button on your calculator and check the power: dividing by a small number gives a big answer.

Marks: 1 mark for dividing the mass of the sack by the mass of one grain (892 857...). 1 mark for 8.93×10^5 .

18 (1 mark)

The diagram shows a circle, centre O .



What is the name of the shaded region?

Circle your answer.

Options: sector, segment, chord, arc

The shaded region is between a chord and an arc.

A region between a chord and an arc is a segment.

(A sector is between two radii and an arc.)

Answer: segment

Tip: Sector: a “pizza slice” with two radii. Segment: cut off by a chord. A chord and an arc are lines, not regions.

19 (3 marks)

The price of a flight increased by 8%

The new price is £151.20

Work out the price before the increase.

The new price is $100\% + 8\% = 108\%$ of the old price.

108% is £151.20

1% is $151.20 \div 108 = £1.40$

100% is $1.40 \times 100 = £140$

Check: $140 \times 1.08 = 151.20$ ✓

Answer: £140

Tip: The 8% is a percentage of the **old** price. Do not take 8% of £151.20 away: that gives £139.10, which is wrong.

Marks: 1 mark for 108% (or 1.08). 1 mark for $151.20 \div 1.08$. 1 mark for £140.

20 (3 marks)

The table shows information about the delivery times for two food delivery services.

	Mean time (minutes)	Shortest time (minutes)	Range (minutes)
Service A	34	28	12
Service B	27	15	31

- (a) Compare the delivery times for the two services.

Compare an average: the mean for Service B (27 minutes) is lower than for Service A (34 minutes).

So on average, Service B delivers more quickly.

Compare the spread: the range for Service A (12 minutes) is smaller than for Service B (31 minutes).

So Service A's delivery times are more consistent.

Answer: On average, Service B is quicker (its mean is lower). Service A's times are more consistent (its range is smaller).

Tip: Make one comparison using the mean and one using the range, and say what each one means for the delivery times. "B's mean is lower" on its own is not enough: say B is quicker on average.

Marks: 1 mark for comparing the means in context. 1 mark for comparing the ranges in context.

- (b) Aisha's food must be delivered within 45 minutes. Which service should she use?
Give a reason for your answer.

Longest time = shortest time + range.

Service A: $28 + 12 = 40$ minutes, so every delivery took 40 minutes or less.

Service B: $15 + 31 = 46$ minutes, so some deliveries took more than 45 minutes.

Aisha should use Service A, even though its mean is higher.

✓ Service A

☐

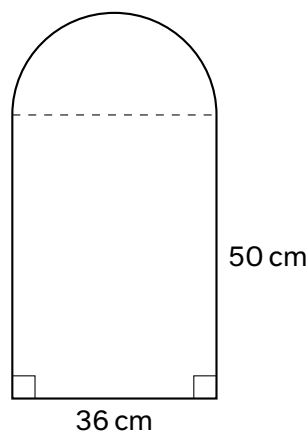
Service B

Answer: Service A: its longest time is $28 + 12 = 40$ minutes, but Service B's longest time is $15 + 31 = 46$ minutes.

Tip: The mean does not tell you the longest time. Add the range to the shortest time to find it.

21 (4 marks)

A mirror is made from a rectangle and a semicircle.



Not drawn accurately

- (a) Work out the area of the mirror.
Give your answer to 1 decimal place.

Rectangle: $36 \times 50 = 1800 \text{ cm}^2$

The diameter of the semicircle is 36 cm, so the radius is 18 cm.

Semicircle: $\frac{1}{2} \times \pi \times 18^2 = 508.938 \dots \text{ cm}^2$

Total: $1800 + 508.938 \dots = 2308.938 \dots$

2308.9 cm² to 1 decimal place.

Answer: 2308.9 cm²

Tip: Use the radius (18 cm), not the diameter, in πr^2 , and halve it for a semicircle.

Marks: 1 mark for the area of the semicircle ($\frac{1}{2} \times \pi \times 18^2$) with the rectangle. 1 mark for 2308.9.

- (b) A strip of wood is fixed around the edge of the mirror.

Work out the length of the strip of wood.

Give your answer to 1 decimal place.

The edge is the bottom, the two sides and the curved top. The dashed line is not part of the edge.

Straight edges: $36 + 50 + 50 = 136$ cm

Curved edge: half the circumference $= \frac{1}{2} \times \pi \times 36 = 56.548 \dots$ cm

Total: $136 + 56.548 \dots = 192.548 \dots$

192.5 cm to 1 decimal place.

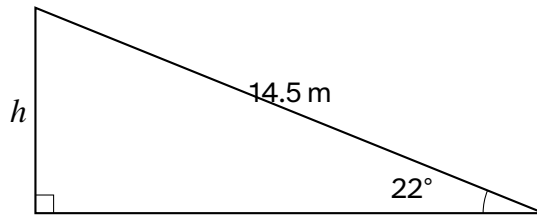
Answer: 192.5 cm

Tip: Only go round the outside. Do not include the dashed line across the middle.

Marks: 1 mark for half the circumference ($\frac{1}{2} \times \pi \times 36$). 1 mark for 192.5.

22 (3 marks)

A conveyor belt carries gravel up from the ground.
The belt is straight and 14.5 m long.
It slopes up at 22° to the horizontal.
 h is the vertical height of the top end of the belt.



Not drawn accurately

Work out the height, h .

Give your answer to 1 decimal place.

Label the sides from the 22° angle: h is opposite and 14.5 is the hypotenuse.

Use sine: $\sin 22^\circ = \frac{h}{14.5}$

$$h = 14.5 \times \sin 22^\circ$$

$$h = 5.431 \dots$$

$$h = 5.4 \text{ m to 1 decimal place.}$$

Answer: 5.4 m

Tip: Opposite and hypotenuse means sine. Check your calculator is in degrees: $14.5 \times \sin 22$ should be about 5.4

Marks: 1 mark for $\sin 22 = h/14.5$. 1 mark for $14.5 \times \sin 22$. 1 mark for 5.4.

23 (3 marks)

A streaming service had 28 640 members at the start of 2025.

During 2025

6 125 members left

9 870 new members joined.

Work out the percentage increase in the number of members during 2025.

Give your answer to 1 decimal place.

Members at the end of 2025: $28\,640 - 6\,125 + 9\,870 = 32\,385$

Increase: $32\,385 - 28\,640 = 3\,745$ (or $9\,870 - 6\,125 = 3\,745$)

$$\text{Percentage increase} = \frac{\text{increase}}{\text{original}} \times 100 = \frac{3\,745}{28\,640} \times 100$$

$$= 13.076 \dots \%$$

$$= 13.1\% \text{ to 1 decimal place.}$$

Answer: 13.1%

Tip: Divide the change by the **original** number (28 640), not by the new number. The change is the new members minus the members who left.

Marks: 1 mark for the overall change (3745) or the new total (32 385). 1 mark for dividing by 28 640. 1 mark for 13.1.

24 (2 marks)

Rearrange $T = 6a + 5c$ to make c the subject.

Subtract $6a$ from both sides: $T - 6a = 5c$

Divide both sides by 5: $\frac{T - 6a}{5} = c$

Answer: $c = \frac{T - 6a}{5}$

Tip: Divide the whole of $T - 6a$ by 5. Writing $c = T - 6a \div 5$ means only $6a$ is divided.

Marks: 1 mark for $T - 6a = 5c$. 1 mark for the final answer.

25 (3 marks)

In a board game, a player rolls two fair six-sided dice.

The score is the difference between the two numbers.

For example, a 5 and a 2 give a score of 3

(a) Work out the probability that the score is 2

Each dice has 6 numbers, so there are $6 \times 6 = 36$ equally likely outcomes.

The pairs with a difference of 2 are: (1, 3), (3, 1), (2, 4), (4, 2), (3, 5), (5, 3), (4, 6), (6, 4)

That is 8 outcomes.

$$P(\text{score } 2) = \frac{8}{36} = \frac{2}{9}$$

	1	2	3	4	5	6
1	0	1	2	3	4	5
2	1	0	1	2	3	4
3	2	1	0	1	2	3
4	3	2	1	0	1	2
5	4	3	2	1	0	1
6	5	4	3	2	1	0

Answer: $\frac{8}{36} = \frac{2}{9}$

Tip: (1, 3) and (3, 1) are different outcomes: count both. A sample space grid of all 36 outcomes makes this easier.

Marks: 1 mark for showing 36 outcomes or 8 ways of getting a score of 2. 1 mark for $8/36$ or equivalent.

- (b) Lydia says, "A score of 0 is the most likely score." Is Lydia correct? Give a reason for your answer.

A score of 0 needs a double: 6 outcomes out of 36

A score of 1 has 10 outcomes: (1, 2), (2, 1), (2, 3), (3, 2), (3, 4), (4, 3), (4, 5), (5, 4), (5, 6), (6, 5)

$10 > 6$, so a score of 1 is more likely than a score of 0

Lydia is not correct.

☐ Yes ☒ No

Answer: No. $P(0) = \frac{6}{36}$ but $P(1) = \frac{10}{36}$, so a score of 1 is more likely.

Tip: Count the outcomes for each score. A double gives 0, and there are only 6 doubles.

26 (4 marks)

An animal rescue centre has only cats, dogs and rabbits. cats : dogs = 5:2 and dogs : rabbits = 4:3. There are 18 rabbits. How many more cats than rabbits are there?

The dogs are in both ratios, so use the rabbits to find the number of dogs first.

Rabbits are 3 parts of dogs : rabbits = 4:3, so one part is $18 \div 3 = 6$

Dogs: $4 \times 6 = 24$

Dogs are 2 parts of cats : dogs = 5:2, so one part is $24 \div 2 = 12$

Cats: $5 \times 12 = 60$

Check: $60:24 = 5:2$ ✓ $24:18 = 4:3$ ✓

More cats than rabbits: $60 - 18 = 42$

Answer: 42

Tip: The dogs link the two ratios, but 2 parts in the first ratio and 4 parts in the second ratio are not the same size, so you cannot just join them as 5:2:3 or 5:4:3. Find the number of dogs first (or write both ratios with the same number for dogs: 10:4:3).

Marks: 1 mark for the number of dogs (24). 1 mark for the number of cats (60). 1 mark for subtracting 18 from your number of cats. 1 mark for 42.

27 (4 marks)

Kofi pays £28.30 for 3 bags of sand and 2 bags of cement. Vic pays £19.10 for 1 bag of sand and 2 bags of cement. Rafael has £30. He wants 2 bags of sand and 3 bags of cement. Does he have enough money?

Let one bag of sand cost $£s$ and one bag of cement cost $£c$

Kofi: $3s + 2c = 28.30$

Vic: $s + 2c = 19.10$

Subtract: Kofi bought 2 more bags of sand than Vic and paid $28.30 - 19.10 = £9.20$ more.

$2s = 9.20$, so $s = 4.60$

Substitute into Vic's equation: $4.60 + 2c = 19.10$, $2c = 14.50$, $c = 7.25$

Check with Kofi: $3 \times 4.60 + 2 \times 7.25 = 13.80 + 14.50 = 28.30$ ✓

Rafael: $2 \times 4.60 + 3 \times 7.25 = 9.20 + 21.75 = £30.95$

£30.95 is more than £30, so Rafael does not have enough money.

☐

Yes

✓ No

Answer: No. Sand costs £4.60 and cement costs £7.25, so Rafael needs £30.95

Tip: The difference between the two bills is the cost of 2 bags of sand (not 1). Check both prices in the first bill before you use them.

Marks: 1 mark for a correct first step to eliminate one item (e.g. $28.30 - 19.10 = 9.20$ for 2 bags of sand). 1 mark for £4.60 or £7.25. 1 mark for $2 \times \text{sand} + 3 \times \text{cement}$ with your prices. 1 mark for No with £30.95.