Sparx Maths

Year 9 Term 2

Revision Workbook

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About this workbook

This workbook supports the revision of topics covered in **Year 9 Term 2** of the Sparx Maths Curriculum.

The workbook is divided into two sections:

- Fluency questions on each unit to practise the key concepts.
- Mixed questions on all topics to strengthen and deepen understanding.
  This section contains more challenging reasoning questions, cross-topic questions and problem solving questions.

If you use Sparx Maths you can find more questions and videos by searching for the following Sparx topic codes in Independent Learning.

Topic codes are also given with each question.

Units	Sparx topic codes
Error intervals	U657 U108 U301
Representations of 3D shapes	U743
Pythagoras' theorem in 2D	U385
Ratio	U687 U577
Proportion word problems	U721 U357 U610
Equations of linear graphs	U315 U669
Speed and rates	U151 U256
Distance-time graphs	U403 U914 U462 U966

Calculator questions are marked with this symbol

Non-calculator questions are marked with this symbol

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Error intervals

Q1
U657

The length, l, of a pencil is $13\,\text{cm}$ to the nearest centimetre (cm).
What number should go in the box to complete the **error interval**?

$$12.5\,\text{cm} \leq l < \square\,\text{cm}$$

Q2
U657

A number, y, rounded to 1 d.p. is 14.3
Write down the error interval for y.

Answer: .....

Q3
U657

A number, p, rounded to 2 significant figures is 0.062
Write down the error interval for p.

Answer: .....

Q4
U108

Truncate 0.48779 to 1 d.p.

Answer: .....

Q5
U108

Truncate 9.286 to 2 d.p.

Answer: .....

Q6
U301

A number, t, truncated to 1 d.p. is 12.7
Write down the error interval for t.

Answer: .....

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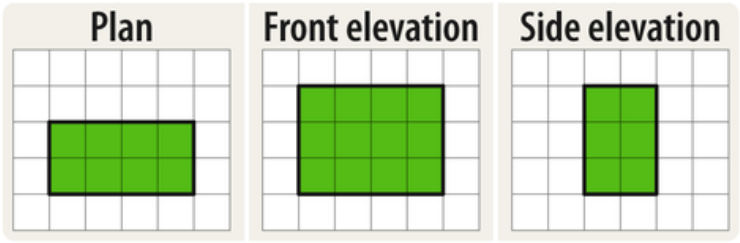
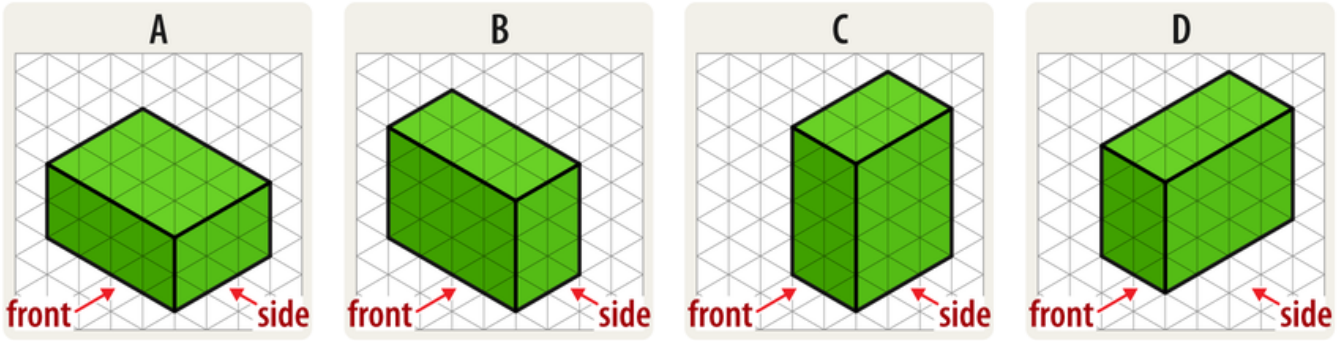
Representations of 3D shapes

Q1

U743

Which of the 3D shapes below is shown by the plan and elevations?



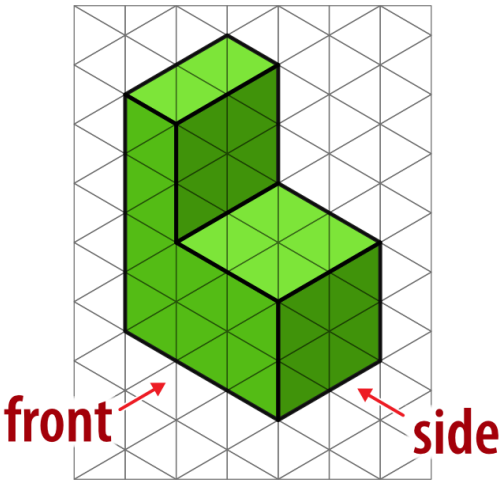


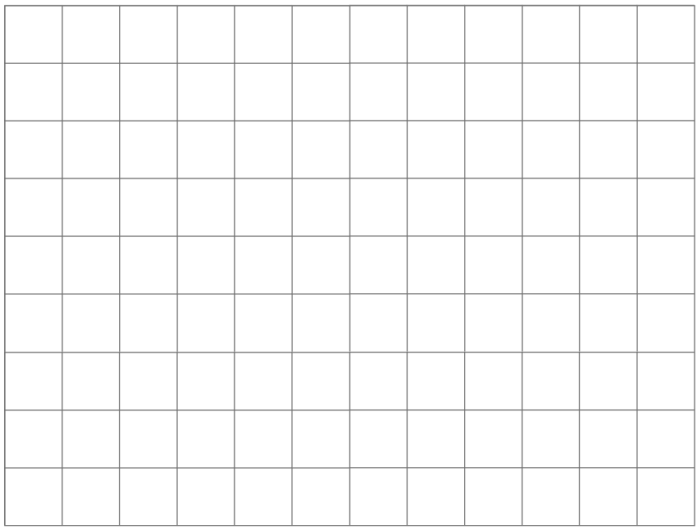
Answer: .....

Q2

U743

Draw the front elevation and the side elevation of this 3D shape.





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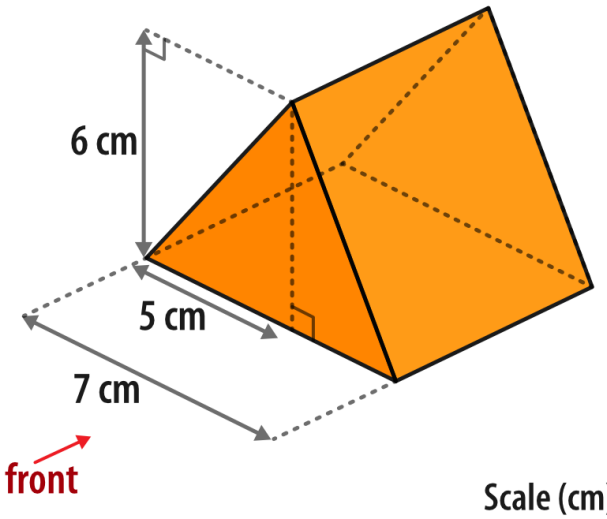
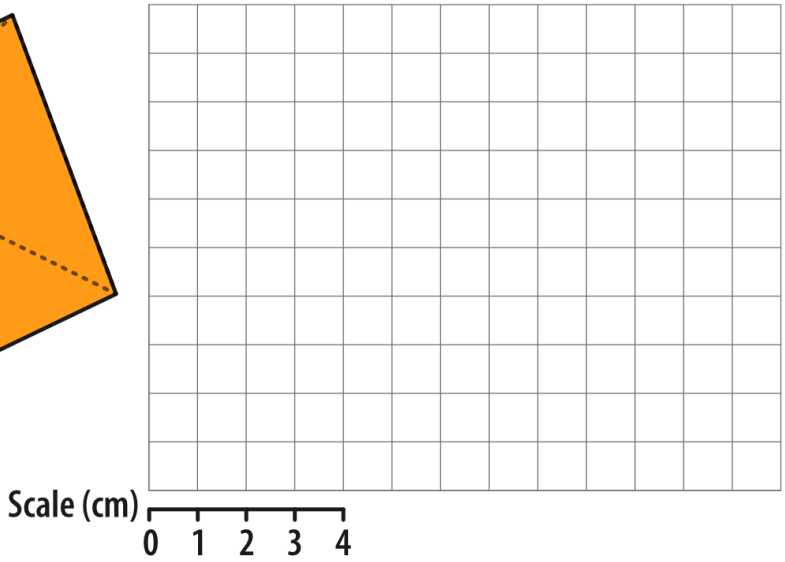
Q3

U743

On the centimetre square grid, draw the front elevation of this prism.

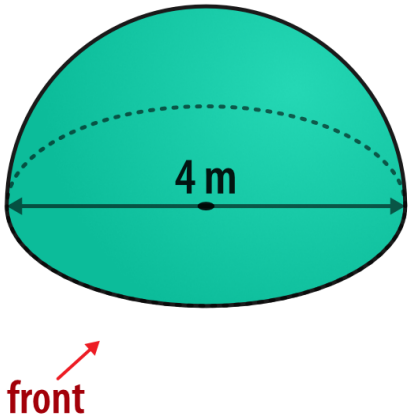


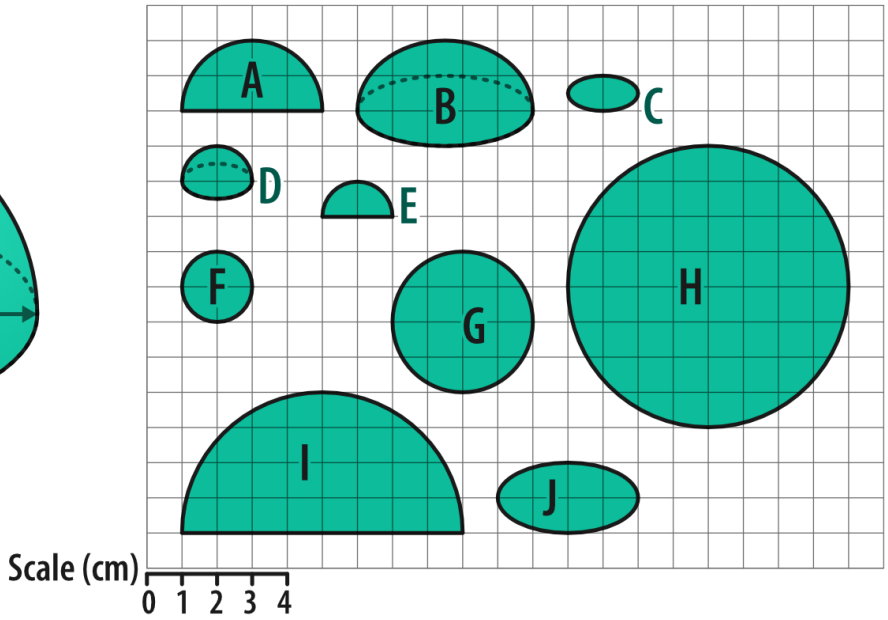


Q4

U743

When using a scale of 1 cm to 2 m, which options on the centimetre square grid show the plan and front elevation of this hemisphere?





Answer: Plan: _____ Front elevation: _____

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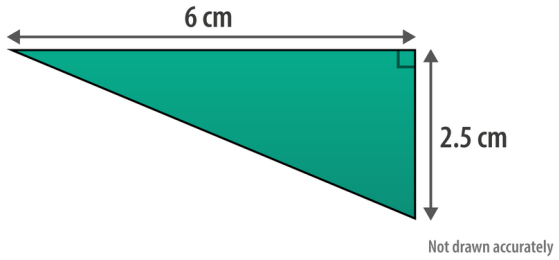
Pythagoras' theorem in 2D

Q1
U385

Using Pythagoras' theorem, calculate the length of the **hypotenuse** in this right-angled triangle.
Give your answer to 1 d.p.

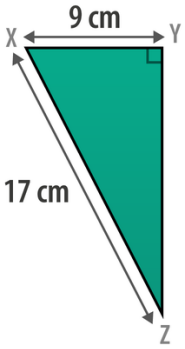


Not drawn accurately

Answer: ..... cm

Q2
U385

Using Pythagoras' theorem, calculate the length of YZ.
Give your answer to 1 d.p.

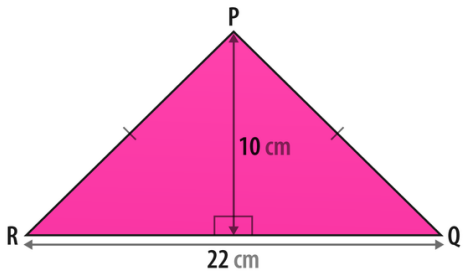


Not drawn accurately

Answer: ..... cm

Q3
U385

Use Pythagoras' theorem to calculate the length of PR in the isosceles triangle below.
Give your answer to the nearest centimetre.



Not drawn accurately

Answer: ..... cm

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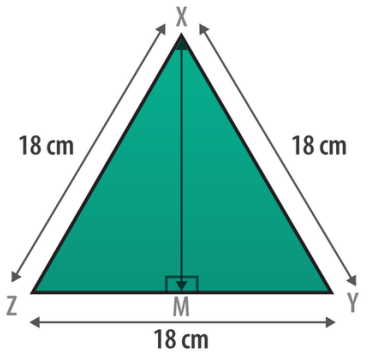
Q4

U385

Use Pythagoras' theorem to work out the height of the equilateral triangle below.
Give your answer to 1 d.p.



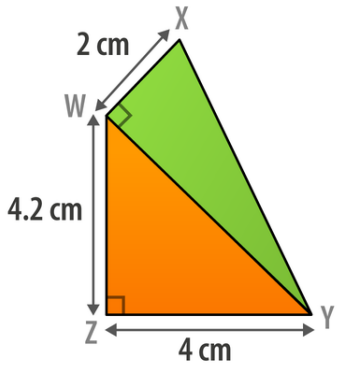
Not drawn accurately

Answer: ..... cm

Q5

U385

Using Pythagoras' theorem, calculate the length of XY.
Give your answer to 1 d.p.



Not drawn accurately

Answer: ..... cm

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Q1
U687

A recipe uses $50\,\text{g}$ of icing sugar and $160\,\text{g}$ of butter.
What is the ratio of icing sugar to butter in its simplest form?

Answer: .....

Q2
U687

A garden contains 57 flowers.
24 of the flowers are lilies, 15 are roses and the rest are sunflowers.
What is the ratio of lilies to roses to sunflowers in its simplest form?

Answer: .....

Q3
U577

A salad dressing is made by mixing oil and vinegar in the ratio $7 : 2$.
Joshua makes $900\,\text{ml}$ of the salad dressing.
How much **oil** does he use?

Answer: ..... ml

Q4
U577

Olivia, Leon and Ruby sold a total of 56 games at a car boot sale.
The ratio of the numbers of games that they each sold is $4 : 3 : 1$.
How many more games did Leon sell than Ruby?

Answer: .....

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Proportion word problems

Q1

U721

Poppy makes some blackberry muffins following the recipe provided. If Poppy uses $330\,\text{g}$ of flour, how many grams (g) of blackberries must she use?

Blackberry Muffins:

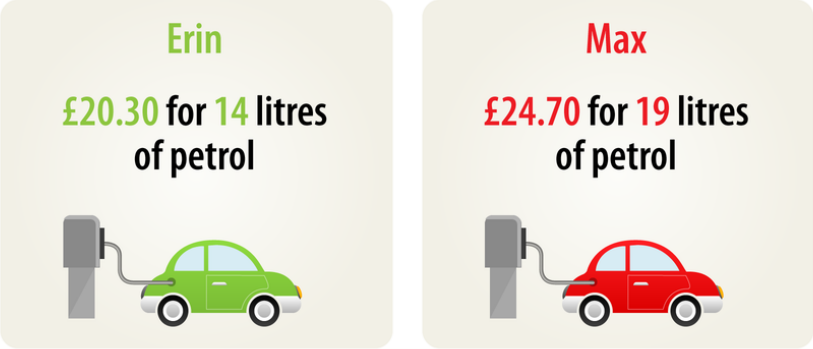
1	egg
110 g	flour
120 g	sugar
60 g	butter
60 g	blackberries

Answer: _____ g

Q2

U721

Erin and Max bought petrol from different petrol stations.



a) Was Erin's petrol or Max's petrol better value for money?

Answer: _____

b) How much would $30\,\text{litres}$ of petrol cost from the **cheaper** petrol station?

Answer: £ _____

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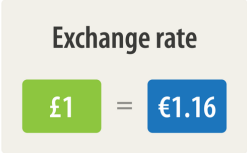
Proportion word problems

Q3

U610

Use the exchange rate below to work out



a) how much $£40$ is worth in euros $(€)$.

Answer: $€$ .....

b) how much $€75.40$ is worth in pounds $(£)$.

Answer: $£$ .....

Q4

U357

It takes 15 people 6 days to lay 22 miles of road.

a) How many days would it take for 5 people to complete the same job?

Answer: ..... days

b) State one assumption you made to answer part a).

Answer: .....

.....

Q5

U357

It takes 7 people 50 minutes to clean a hotel lobby.
How many minutes would it take 5 people?

Answer: ..... minutes

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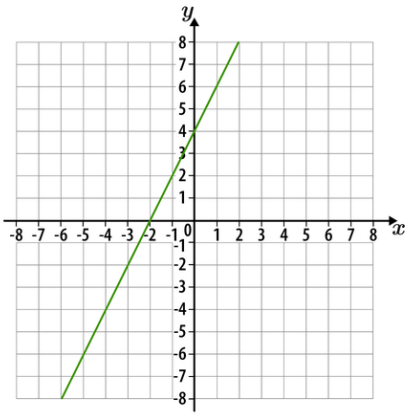
Equations of linear graphs

Q1

U315

A straight line is shown on the coordinate grid below.



a) What is the y-intercept of this line?

Answer: .....

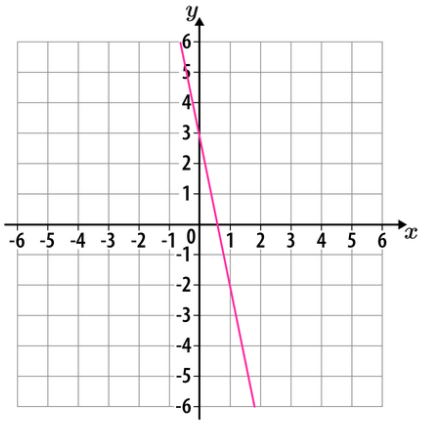
b) What is the gradient of this line?

Answer: .....

Q2

U315

Work out the equation of the straight line shown below.
Give your answer in the form $y = mx + c$, where m and c are integers or fractions in their simplest forms.



Answer: .....

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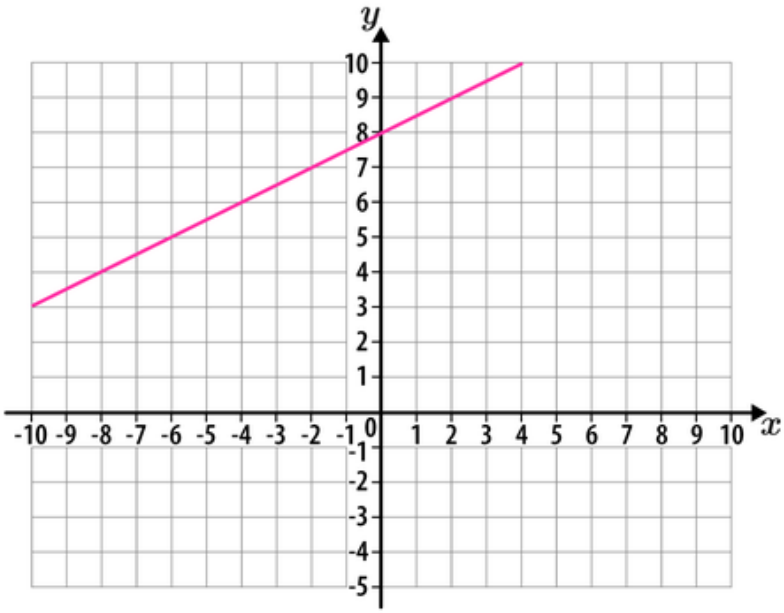
Q3

U315

What is the equation of the straight line shown below?

Give your answer in the form $y = mx + c$, where m and c are integers or fractions in their simplest forms.



Answer: .....

Q4

U669

A line has the equation $y = 3x - 15$

a) What is the gradient of the line?

Answer: .....

b) What is the y-intercept of the line?

Answer: .....

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Q5

U669

A line has the equation $y + x = 4x + 11$

What is the gradient of the line?

Answer: .....

Q6

U669

A line has the equation $2y = 9x - 5$

a) What is the gradient of the line?

Answer: .....

b) What is the y-intercept of the line?

Answer: .....

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Speed and rates

Q1
U151

A drone takes 40.8 seconds to travel 300 metres.
Calculate the average speed of the drone.
Give your answer to 2 d.p.

Answer: _____ $\mathrm{m/s}$

Q2
U256

An oven used 8.24 units of electricity over 5 hours.
What is the rate of electricity usage for this oven?
Give your answer to 1 d.p.

Answer: _____ units per hour

Q3
U151

Martin completed a 66 kilometre cycling race at an average speed of $10.56\,\mathrm{km/h}$.
How long did he take to complete the race?
Give your answer in hours and minutes.

Answer: _____ hours and _____ minutes

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Q4

U151

Dylan drove from Liverpool to Sunderland at an average speed of 50 mph for 3 hours and 30 minutes.
He then drove from Sunderland to Edinburgh at an average speed of 65 mph for 2 hours.
Work out how many miles Dylan travelled in total.

Answer: ..... miles

Q5

U256

Coco buys and downloads a film from the internet. The film is 1680 MB in size.
Coco's internet download speed is 1.4 MB per second.
If she starts the download at 13:00, at what time will the download finish?

Answer: .....

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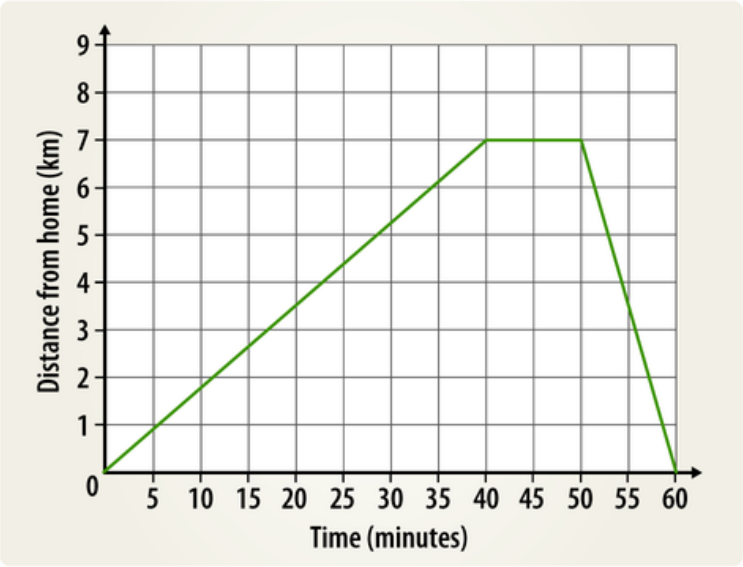
Distance-time graphs

Q1
U914

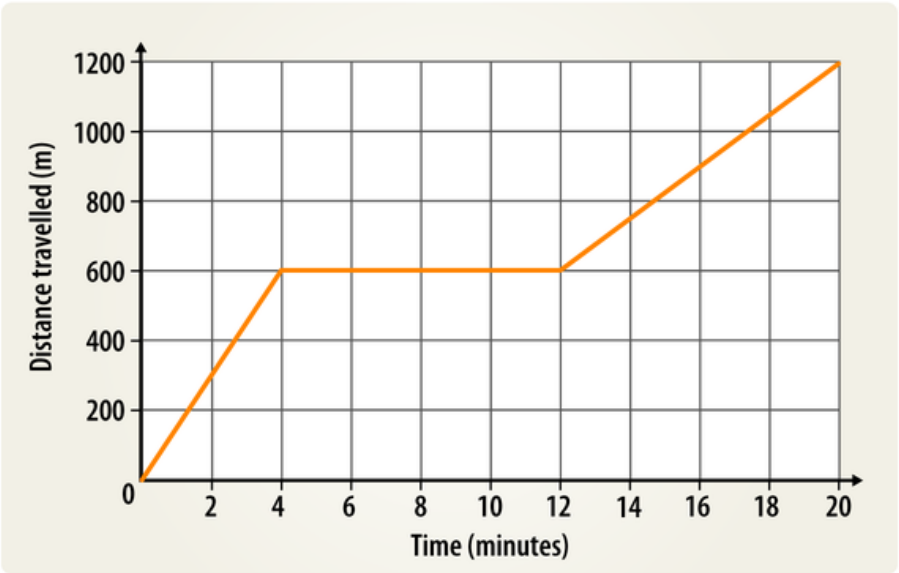
This distance-time graph shows Beth's journey to a shop and back again.
How far is the shop from Beth's home?



Answer: _____ km

Q2
U914

This distance-time graph shows Niall's journey to school. He stopped at his friend's house on the way.
How long did he stop for?



Answer: _____ minutes

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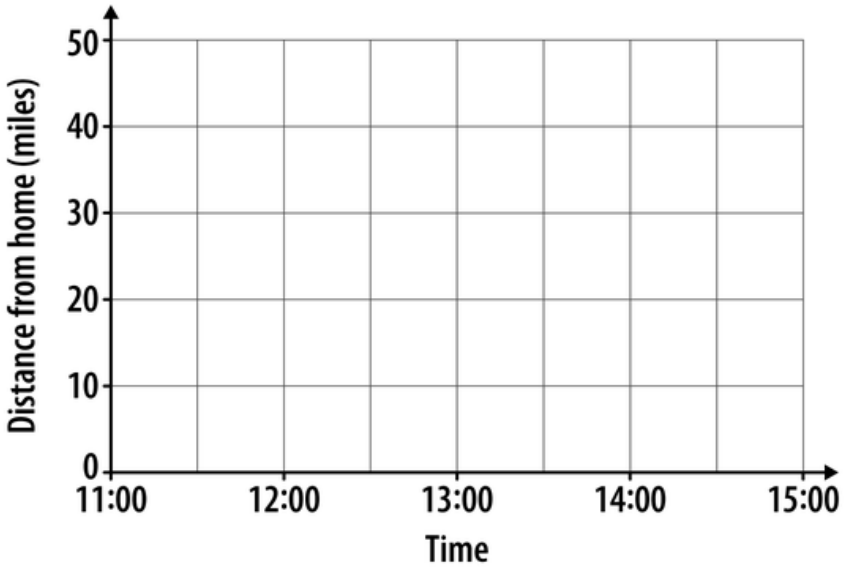
Q3

U403

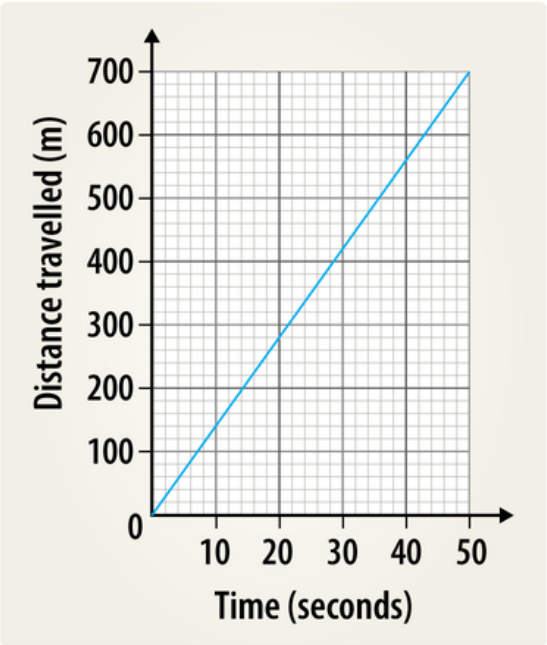
Katie leaves home at 11:00 and travels at a constant speed to a beach that is 30 miles away.
She arrives at the beach at 12:00 and stays until 14:00.
She then travels home at a constant speed and arrives at 14:30.
Draw the distance-time graph of Katie's journey.



Q4

U462

This distance-time graph shows part of the journey of a train.
Calculate the speed of the train.



Answer: _____ m/s

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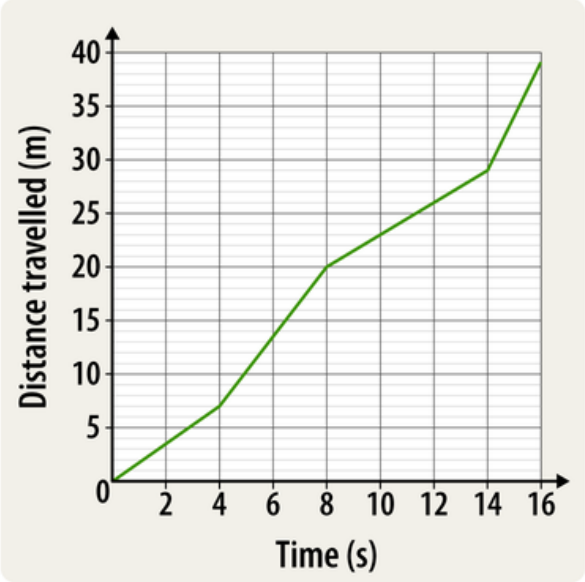
Q5
U462

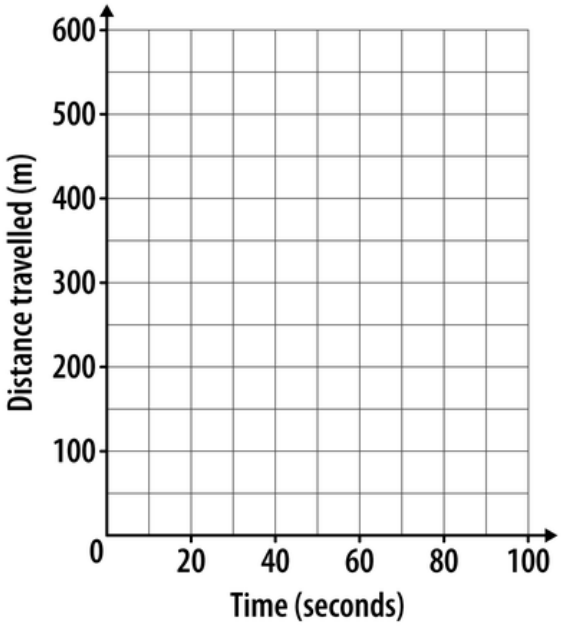
This distance-time graph shows the journey of a robin.
Calculate the average speed of the robin between 4 and 14 seconds.



Answer: _____ m/s

Q6
U966

Archie ran a 400 m race.
For the first 20 seconds of the race he ran at a constant speed of 7.5 m/s.
He ran the rest of the race at a constant speed of 5 m/s.
Draw the distance-time graph of Archie's race.



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Q1

U657

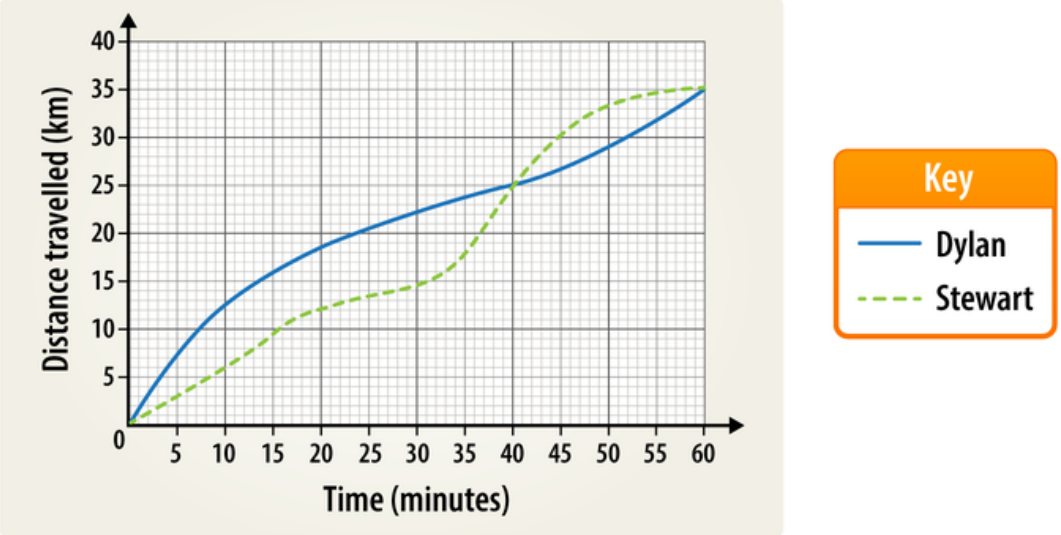
Sue thinks of a whole number.
Rounded to the nearest 10, her number is 850.
Rounded to the nearest 100, her number is 900.
Her number is odd.
What could her number be?

Answer: .....

Q2

U914

Dylan and Stewart took part in a cycling race and their progress was recorded in this distance-time graph.
How long after the start of the race did Stewart overtake Dylan?



Answer: ..... minutes

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Q3
U669

Which of the equations below describes the steepest line?

$y = 7x - 1$ $y = 3x - 26$ $y = x + 43$

$y = 4x - 6$ $y = 2x + 20$

Answer: .....

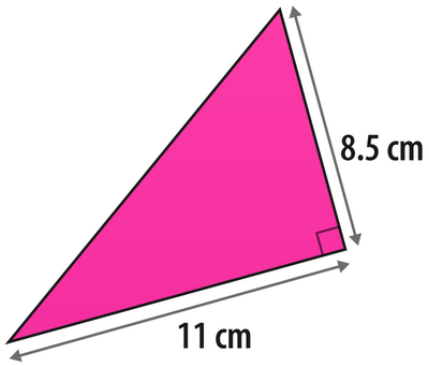
Q4
U577

Vincent and Anaya share £1800. Anaya gets twice as much money as Vincent.
How much does Anaya receive?

Answer: £ .....

Q5
U385

Using Pythagoras' theorem, calculate the perimeter of the right-angled triangle below.
Give your answer to 1 d.p.



Not drawn accurately

Answer: ..... cm

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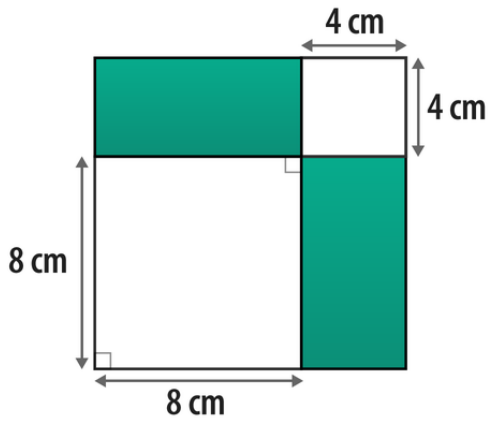
Q6
U687

Two parts of this square are shaded. The other two parts are unshaded. What is the ratio of the shaded area to the unshaded area? Give your answer in its simplest form.

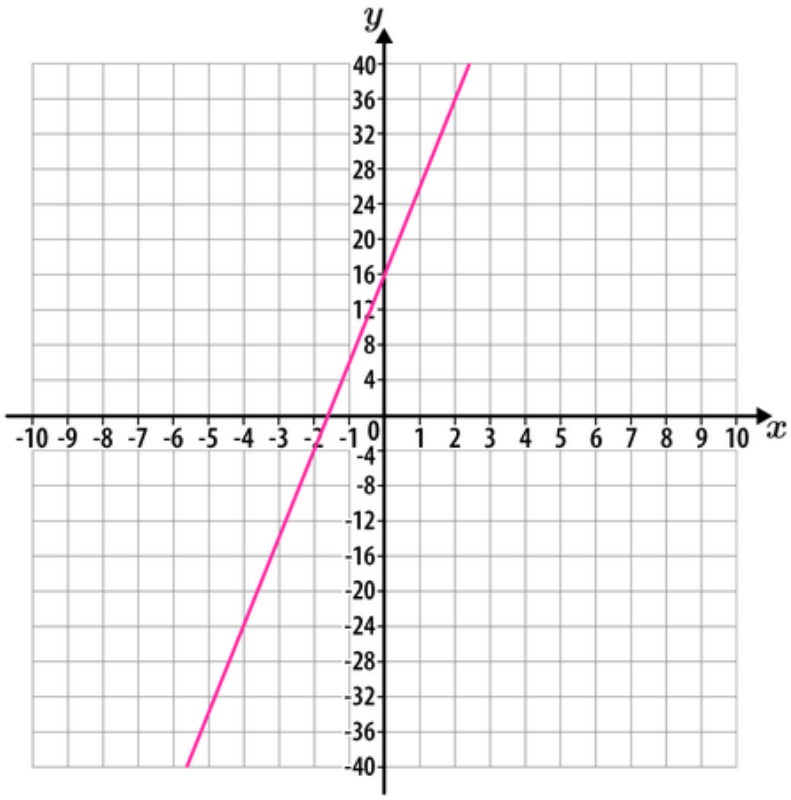


Not drawn accurately

Answer: .....

Q7
U315

What is the equation of the straight line shown below?
Give your answer in the form $y = mx + c$, where m and c are integers or fractions in their simplest forms.



Answer: .....

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Q8
U301

Safa chooses a number, r, which satisfies the inequality
$16.2 \leq r < 16.3$
What is r truncated to 1 decimal place?

Answer: _____

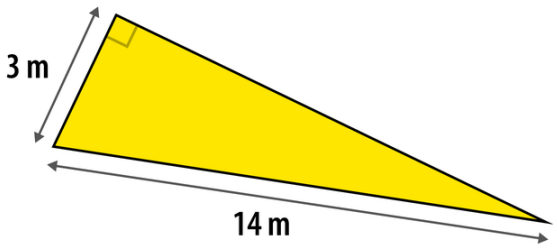
Q9
U577

The angles in a triangle are in the ratio $3 : 1 : 2$
Calculate the size of each angle.

Answer: _____ ° _____ ° _____ °

Q10
U385

Calculate the **area** of this right-angled triangle.
Give your answer to 1 d.p.



Not drawn accurately

Answer: _____ m^2

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Q11

U721

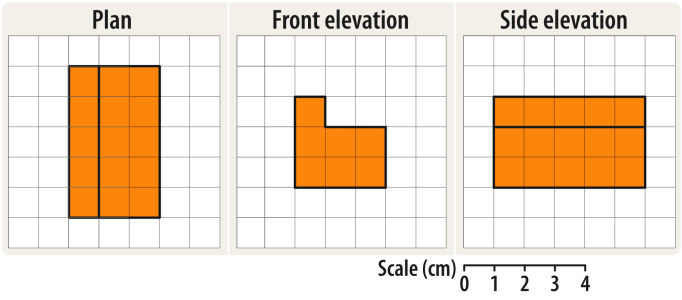
Emilie wants to travel 240 miles. How much would the **cheaper** taxi journey cost her?

Answer: £ .....

Q12

U743

The plan, front elevation and side elevation of a prism are shown.
Sketch the solid prism. Write the dimensions of the prism on your sketch.



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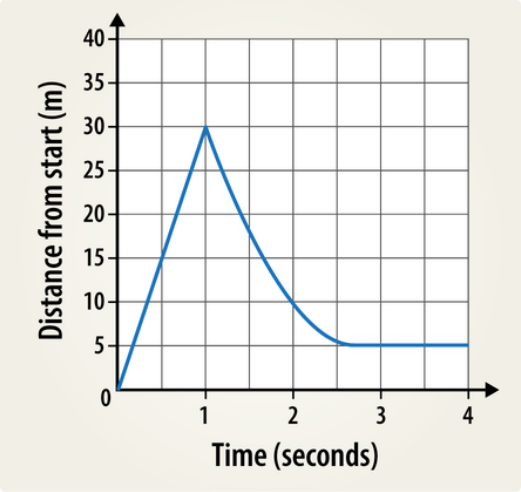
Q13
U914

An ice hockey player hits a puck at a wall. The puck rebounds and then comes to a stop. This distance-time graph shows the journey of the puck.
What is the total distance that the puck travels?



Answer: ..... m

Q14
U669

Circle the equations below which describe straight lines.

$y = 7x^2 + 1$ $y = 5$ $4y = 8x$

$y + 3 = \frac{2}{x}$ $3y - 7 = 6x$

Q15
U657

The length, l, of a plank of wood is $6.3\,\text{m}$ when rounded to the nearest $10\,\text{cm}$.
Write down the error interval, in centimetres (cm), for l.

Answer: .....

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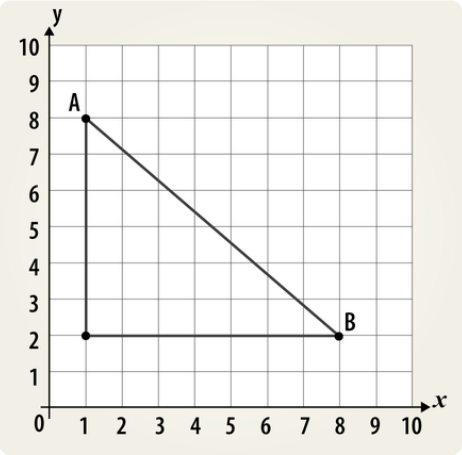
Q16
U256

Megan's standard pay is $£17.70$ per hour. She gets paid 1.5 times this rate for working overtime.
How much will Megan get paid for working 11 hours of overtime?
Give your answer to the nearest pound.

Answer: $£$ .....

Q17
U385

Point A and point B have been plotted on a centimetre square grid. Point A has coordinates $(1, 8)$ and point B has coordinates $(8, 2)$, as shown below.
Using Pythagoras' theorem, calculate the distance from A to B.
Give your answer to 1 d.p.



Answer: ..... cm

Q18
U151

An eagle travelled 6 km in 400 seconds.
Calculate the average speed of the eagle in **metres per second** (m/s).

Answer: ..... m/s

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Q19

U610

Harry bought a watch in Singapore for 68 Singapore dollars.
Lexie bought the same model of watch in Hong Kong for 357 Hong Kong dollars.
Using the exchange rates below, calculate the difference between the amounts that Harry and Lexie paid for their watches.
Give your answer in pounds.

1 Singapore dollar = £0.53

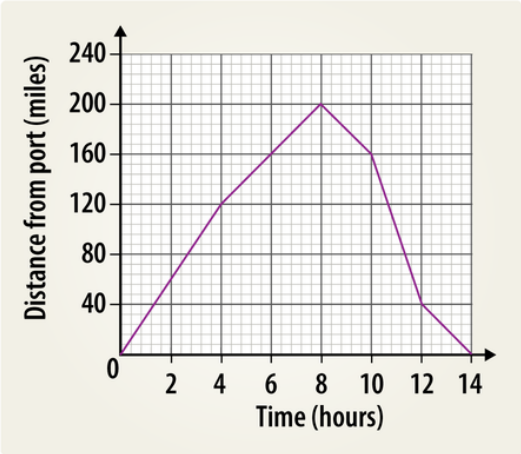
£1 = 10.50 Hong Kong dollars

Answer: £ .....

Q20

U462

This distance-time graph shows the journey a boat made when it travelled away from a port and then returned.
What was the **fastest** speed that the boat reached during the journey?



Answer: ..... miles per hour

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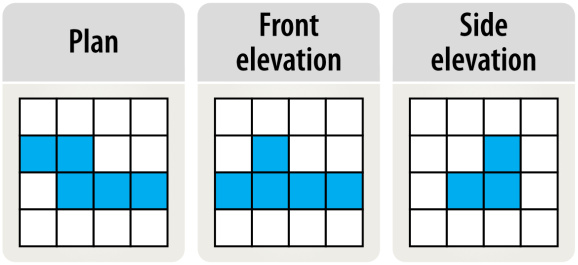
Q21

U743

A solid is made from identical cubes.
Its plan, front elevation and side elevation are shown below.
How many cubes is the solid made from?



Answer: .....

Q22

U357

A stationery shop orders a batch of pens from a factory.
The factory could make the batch of pens in 20 days using 12 machines.
Due to a fault, only 3 machines were used for the first 8 days.
All 12 machines were used from day 9 onwards.
Work out the total number of days taken to make the batch of pens.

Answer: ..... days

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Q23

U669

Line N has an equation of $2y = 4x + 3$

Line Q has an equation of $4y + x - a = 0$, where a is a number.

If line N and line Q have the same y-intercept, what is the value of a?

Answer: $a =$ .....

Q24

U151

A car is travelling at $48.6\,\mathrm{km/h}$.

Convert this speed into $\mathrm{m/s}$.

Answer: ..... $\mathrm{m/s}$

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Answers

Error intervals

Q1 13.5

Q2 $14.25 \leq y < 14.35$

Q3 $0.0615 \leq p < 0.0625$

Q4 0.4

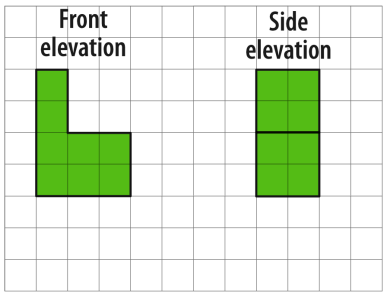
Q5 9.28

Q6 $12.7 \leq t < 12.8$

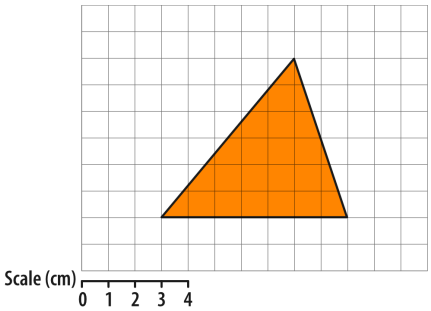
Representations of 3D shapes

Q1 B

Q2



Q3



Q4 Plan: F

Front elevation: E

Pythagoras' theorem in 2D

Q1 6.5 cm

Q2 14.4 cm

Q3 15 cm

Q4 15.6 cm

Q5 6.1 cm

Ratio

Q1 $5 : 16$

Q2 $8 : 5 : 6$

Q3 700 ml

Q4 14

Proportion word problems

Q1 180 g

Q2 a) Max's petrol was better value for money

b) £ 39

Q3 a) € 46.40

b) £ 65

Q4 a) 18 days

b) The people all lay the road at the same rate

Q5 70 minutes

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Answers

Equations of linear graphs

Q1 a) y-intercept $= 4$

b) gradient $= 2$

Q2 $y = -5\ x + \ 3$

Q3 $y = \frac{1}{2}\ x + 8$

Q4 a) 3

b) -15

Q5 3

Q6 a) $\frac{9}{2}$

b) $-\frac{5}{2}$

Speed and rates

Q1 7.35 m/s

Q2 1.6 units per hour

Q3 6 hours and 15 minutes

Q4 305 miles

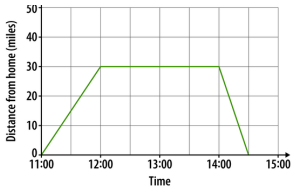
Q5 $13 : 20$

Distance-time graphs

Q1 7 km

Q2 8 minutes

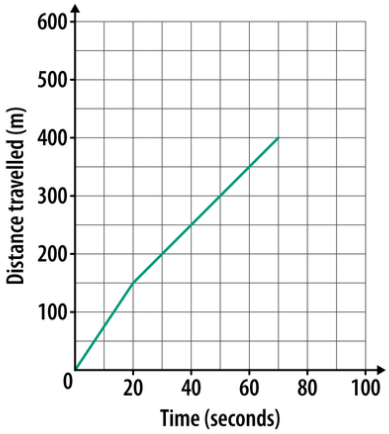
Q3



Q4 14 m/s

Q5 2.2 m/s

Q6



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Mixed questions

Q1 851 or 853

Q2 40 minutes

Q3 $y = 7x - 1$

Q4 £ 1200

Q5 33.4 cm

Q6 4 : 5

Q7 $y = 10\ x + \ 16$

Q8 16.2

Q9 30 °

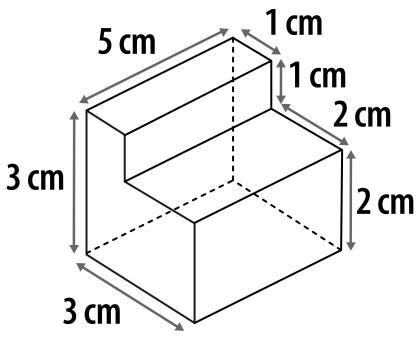
60 °

90 °

Q10 20.5 m^2

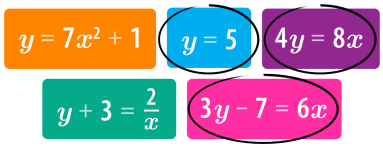
Q11 £ 216

Q12



Q13 55 m

Q14



Q15 625 cm $\leq l <$ 635 cm

Q16 £ 292

Q17 9.2 cm

Q18 15 m/s

Q19 £ 2.04

Q20 60 miles per hour

Q21 6

Q22 26 days

Q23 $a = 6$

Q24 13.5 m/s

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