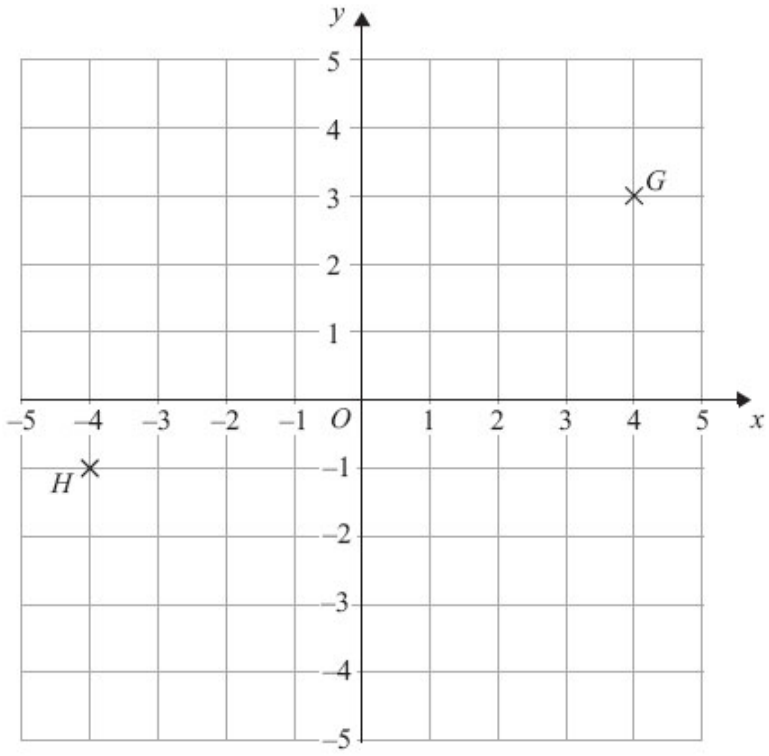
Foundation tier unit 9a check in test

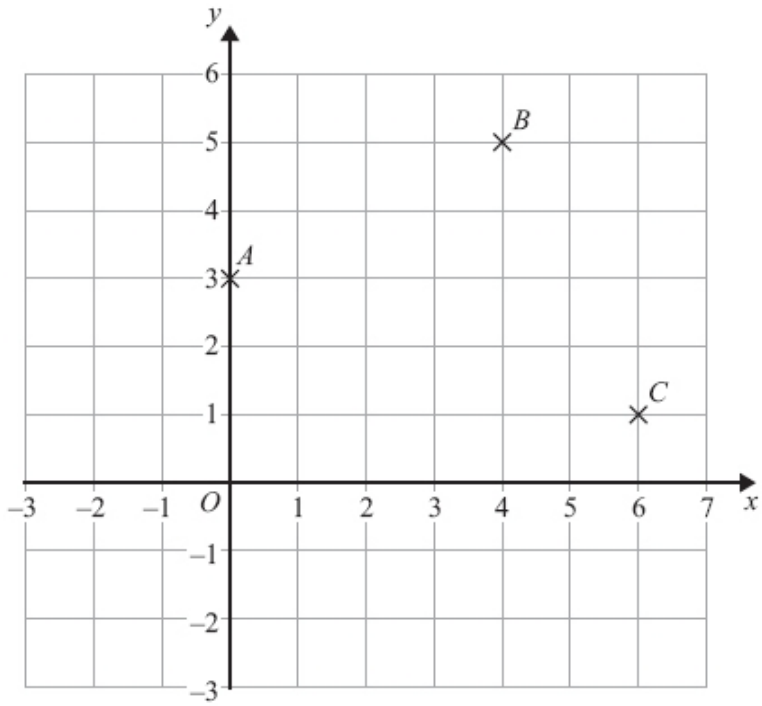
Calculator

Q1.



Write down the coordinates of the points *G* and H, and the coordinates of the midpoint of *GH*.

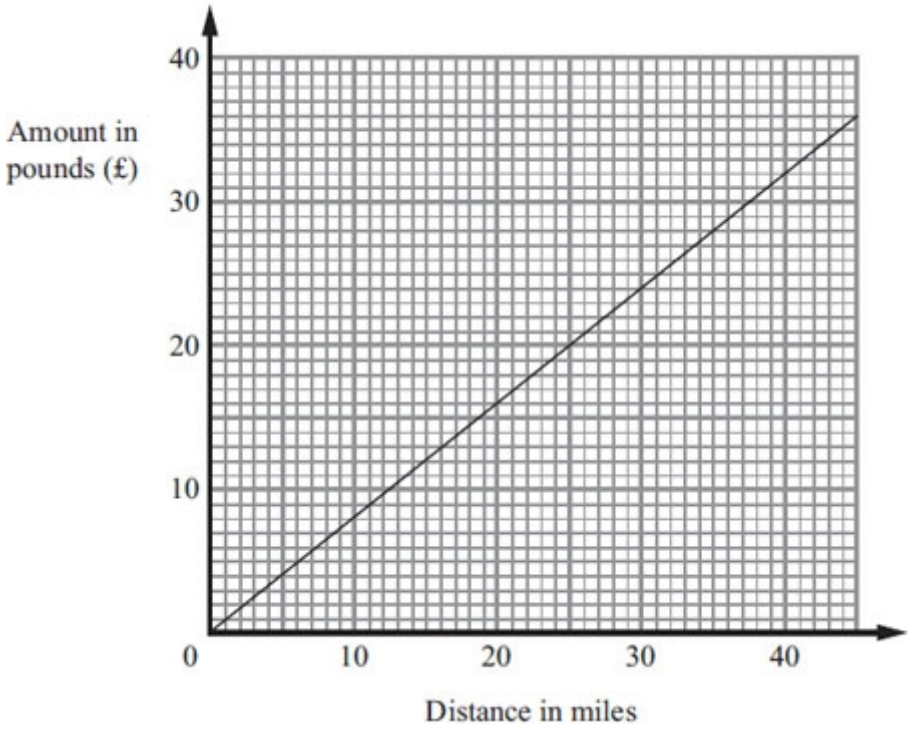
Q2.



On the grid, mark with a cross (×) the point *D* so that *ABCD* is a square.

[Q3–Q4 linked]

Q3. Sophie's company pays her 80p for each mile she travels.
The graph can be used to work out how much her company pays her for travel.

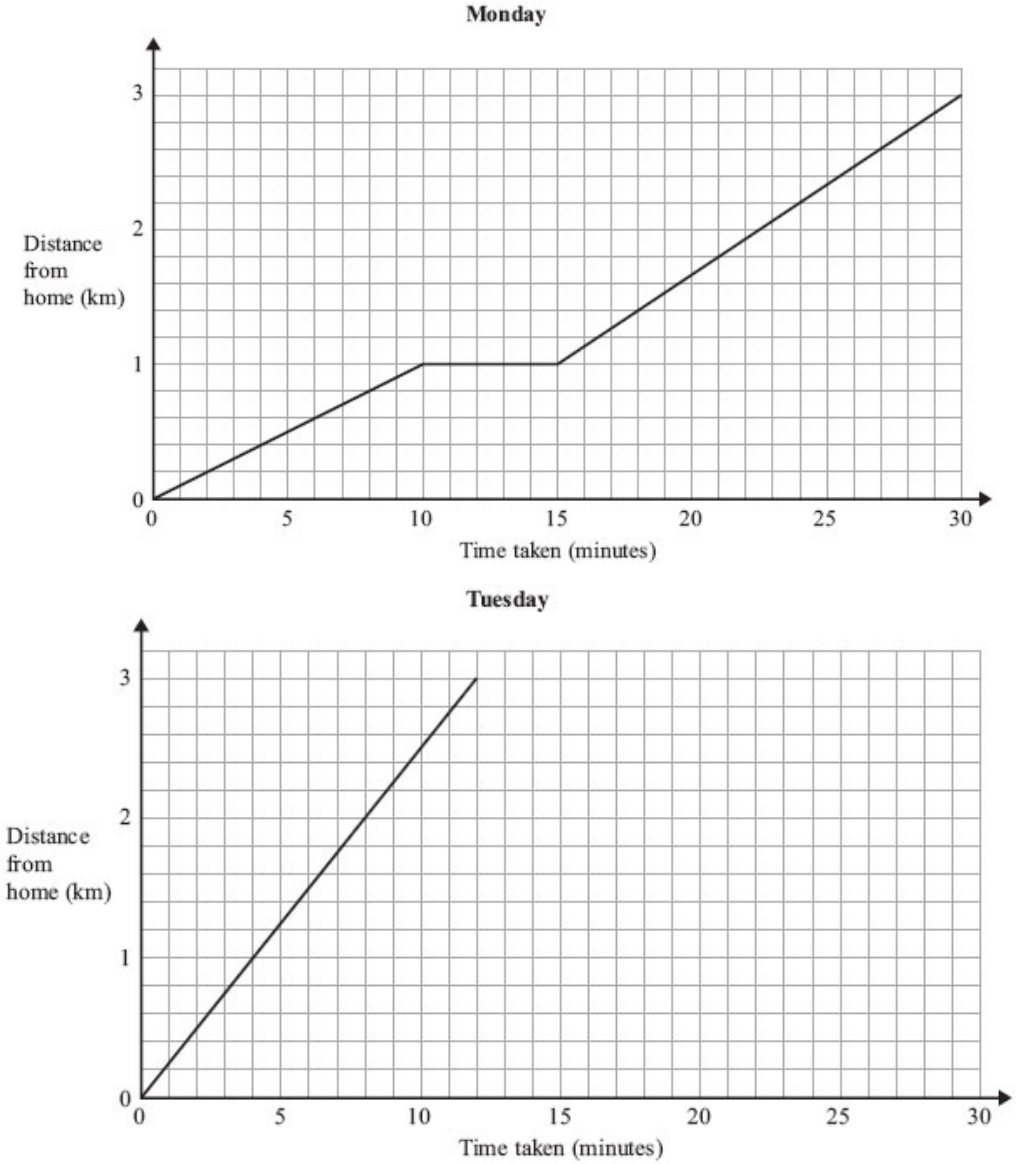


Sophie travels 20 miles.
Work out how much her company pays her.

Q4. Sophie's company paid her £60.
Use the graph in question 3 to work out the distance Sophie travelled.

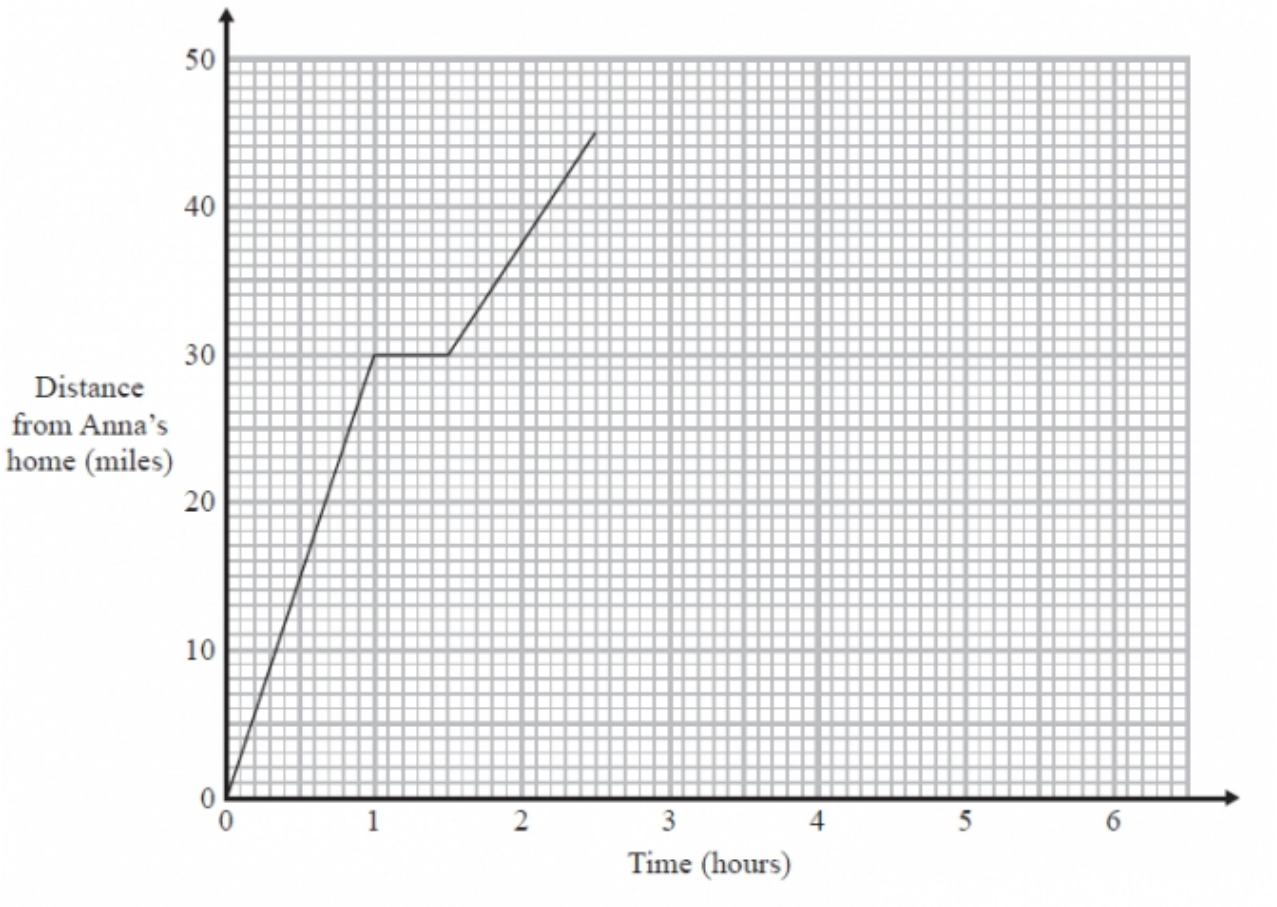
Q5. On Monday, Holly walked from her home to school.
She stopped at her friend's house on the way to school.

On Tuesday, Holly cycled from her home to school.
The travel graphs show Holly's journey on Monday and on Tuesday.



Holly took less time to get to school on Tuesday than on Monday.
How many minutes less?

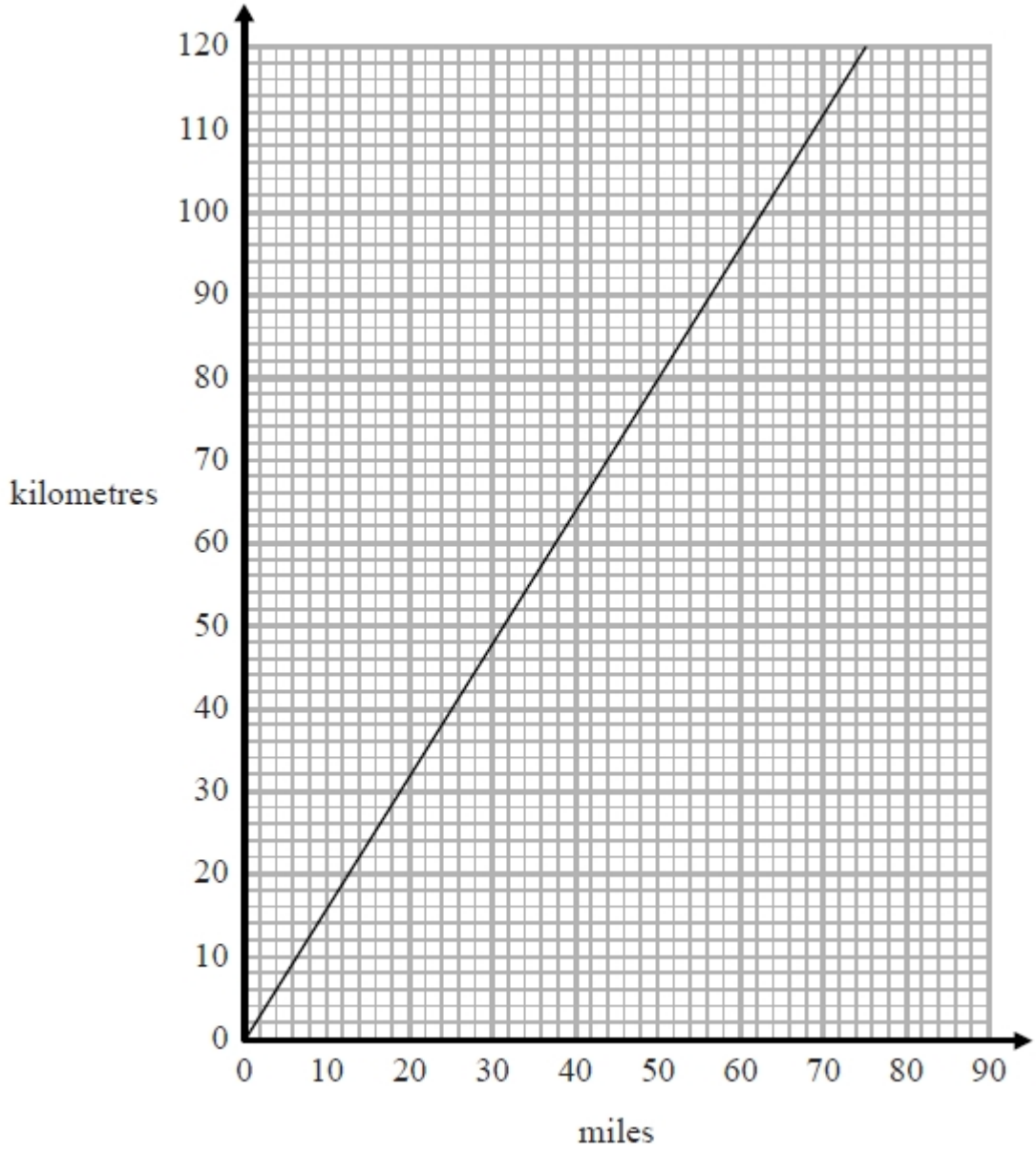
Q6. Anna drives 45 miles from her home to a meeting.
Here is the travel graph for Anna's journey to the meeting.



Anna's meeting lasts for 1 hour.
She then drives home at a steady speed of 30 miles per hour with no stops.

Complete the travel graph to show this information.

Q7. You can use this graph to change between miles and kilometres.

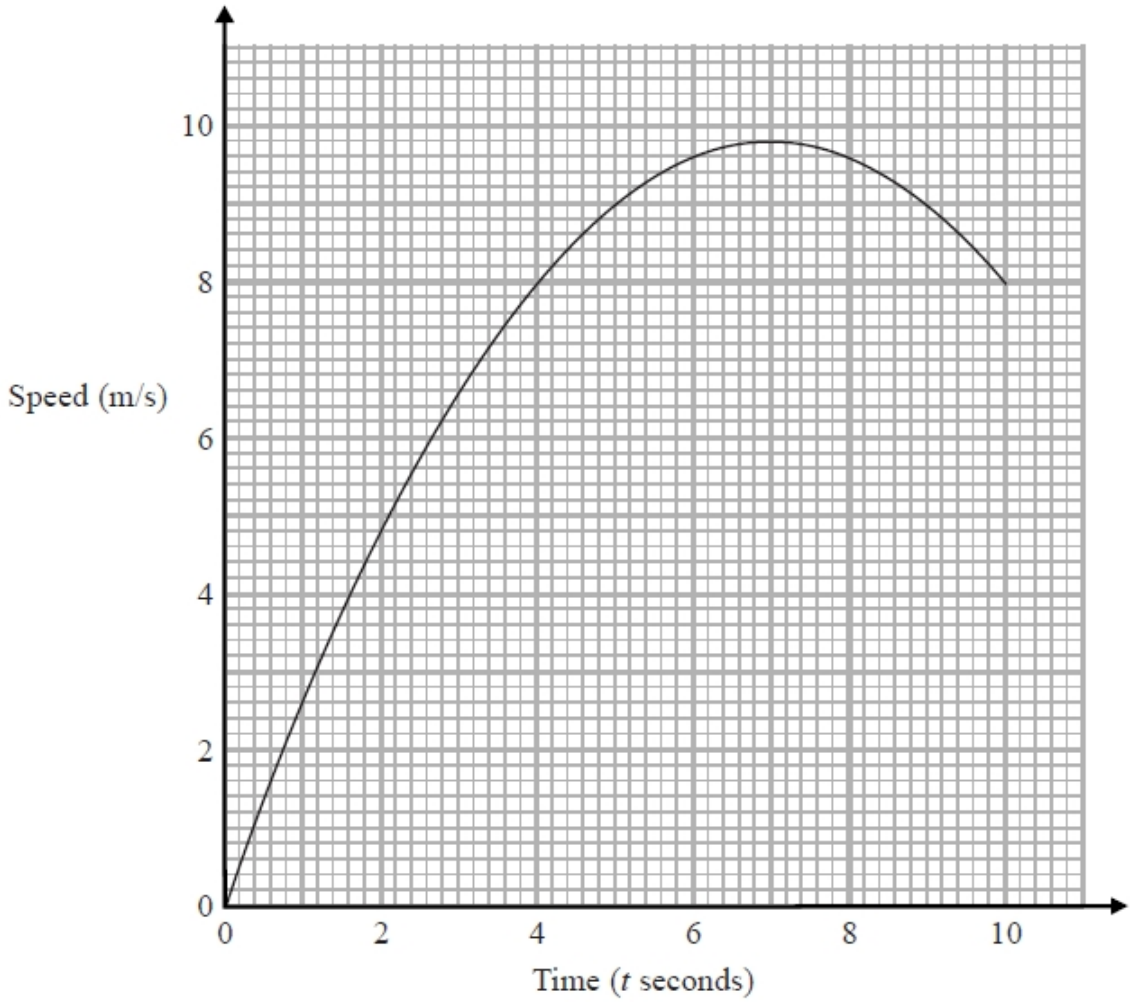


The distance from Paris to London is 280 miles.
The distance from Paris to Amsterdam is 500 kilometres.

Is Paris further from London or further from Amsterdam, and by how much?

[Q8–Q9 linked]

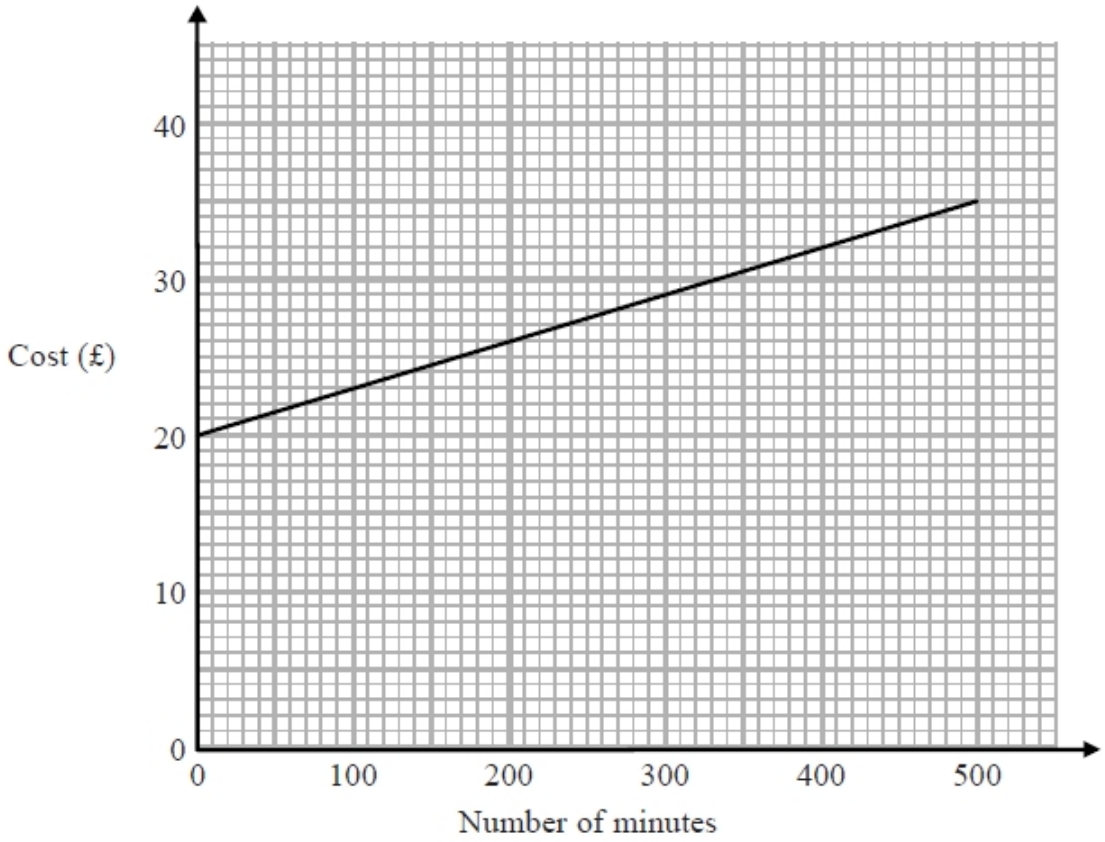
Q8. Karol ran in a race.
The graph shows her speed, in metres per second, t seconds after the start of the race.



Write down Karol's greatest speed.

Q9. There were two times when Karol's speed was 9 m/s.
Use the graph in question 8 to write down these two times.

Q10. The graph shows the cost of using a mobile phone for one month for different numbers of minutes of calls made.



The cost includes a fixed rental charge of £20 and a charge for each minute of calls made.
Work out the charge for each minute of calls made.

Topics listed in objectives

- Use input/output diagrams;
- Draw, label and scale axes;
- Use axes and coordinates to specify points in all four quadrants in 2D;
- Identify points with given coordinates and coordinates of a given point in all four quadrants;
- Find the coordinates of points identified by geometrical information in 2D (all four quadrants);
- Find the coordinates of the midpoint of a line segment; Read values from straight-line graphs for real-life situations;
- Draw straight line graphs for real-life situations, including ready reckoner graphs, conversion graphs, fuel bills graphs, fixed charge and cost per unit;
- Draw distance–time graphs and velocity–time graphs;
- Work out time intervals for graph scales;
- Interpret distance–time graphs, and calculate: the speed of individual sections, total distance and total time;
- Interpret information presented in a range of linear and non-linear graphs;
- Interpret graphs with negative values on axes;
- Find the gradient of a straight line from real-life graphs;
- Interpret gradient as the rate of change in distance–time and speed–time graphs, graphs of containers filling and emptying, and unit price graphs.

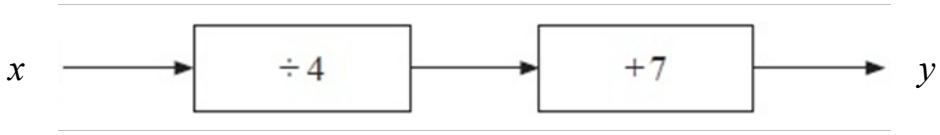
Answers

Q1. G (4, 3), H (–4, –1), midpoint of GH (0, 1)
Q2. D (2, –1)
Q3. £16
Q4. 75 miles
Q5. 30 – 12 = 18 minutes
Q6. line from (2.5, 45) to (3.5, 45), and line from (3.5, 45) to (5, 0)
Q7. Paris is further from Amsterdam than from London by 52 miles
Q8. 9.8 m/s
Q9. 5 and 9 seconds
Q10. 3p per minute

Foundation tier unit 9b check in test

Non-calculator

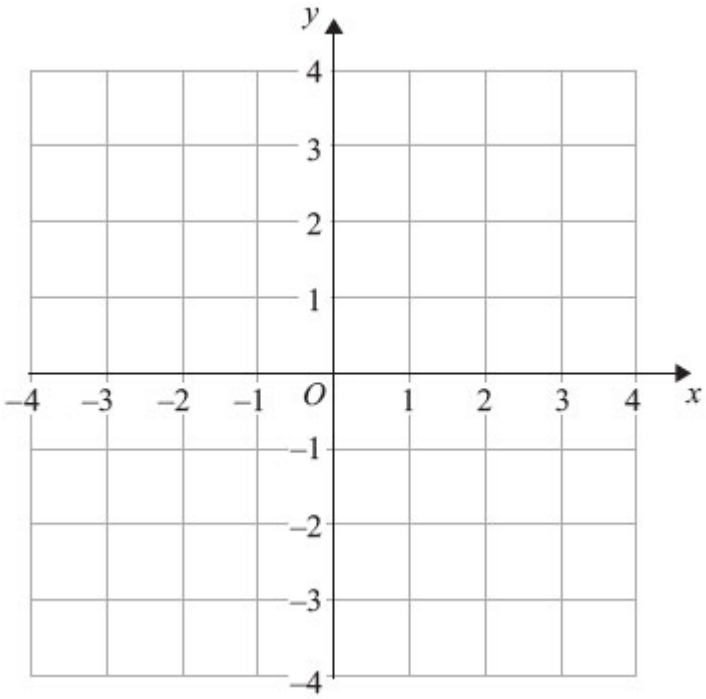
Q1. Here is a function machine.



Use the function machine to complete these pairs of coordinates.

(12, __) and (__ , 27)

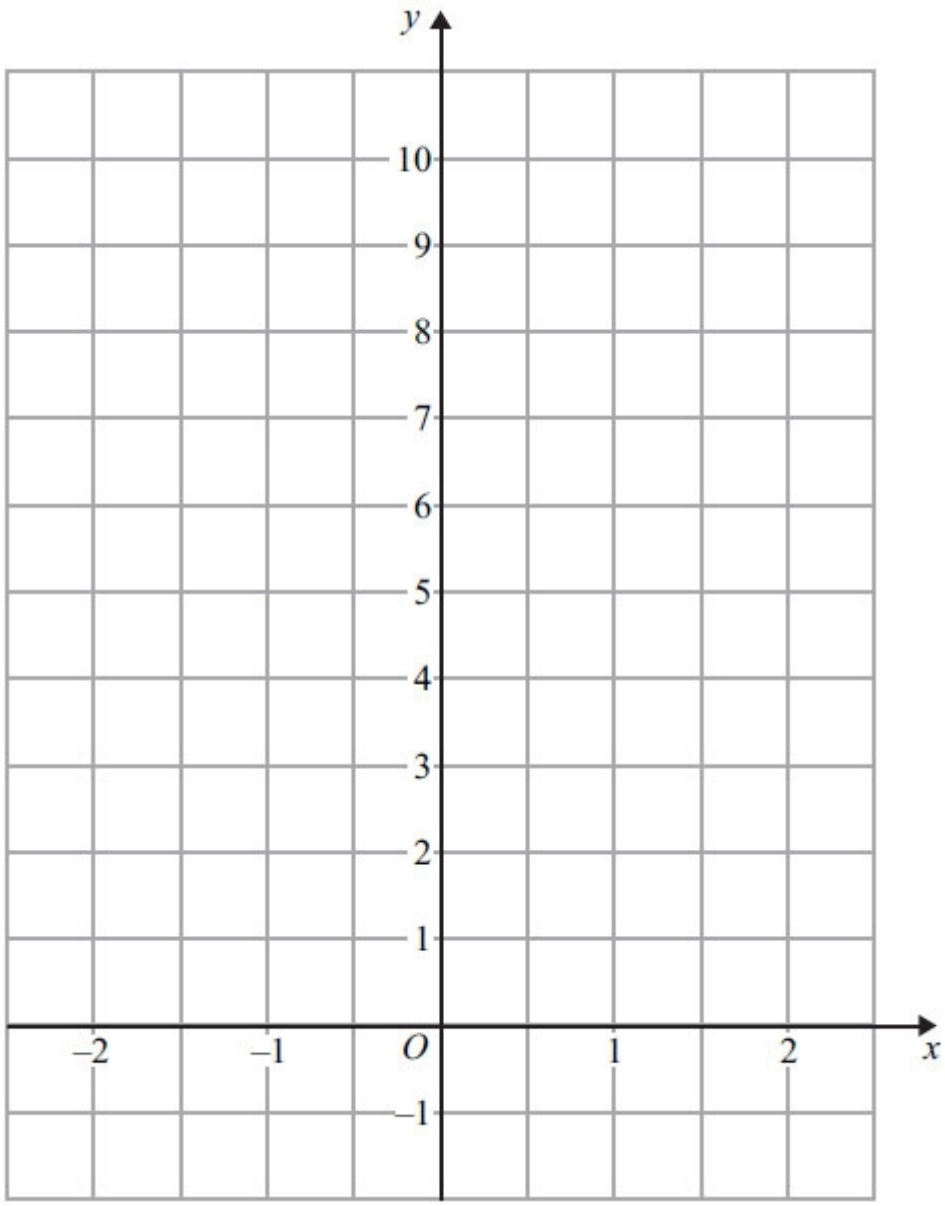
Q2.



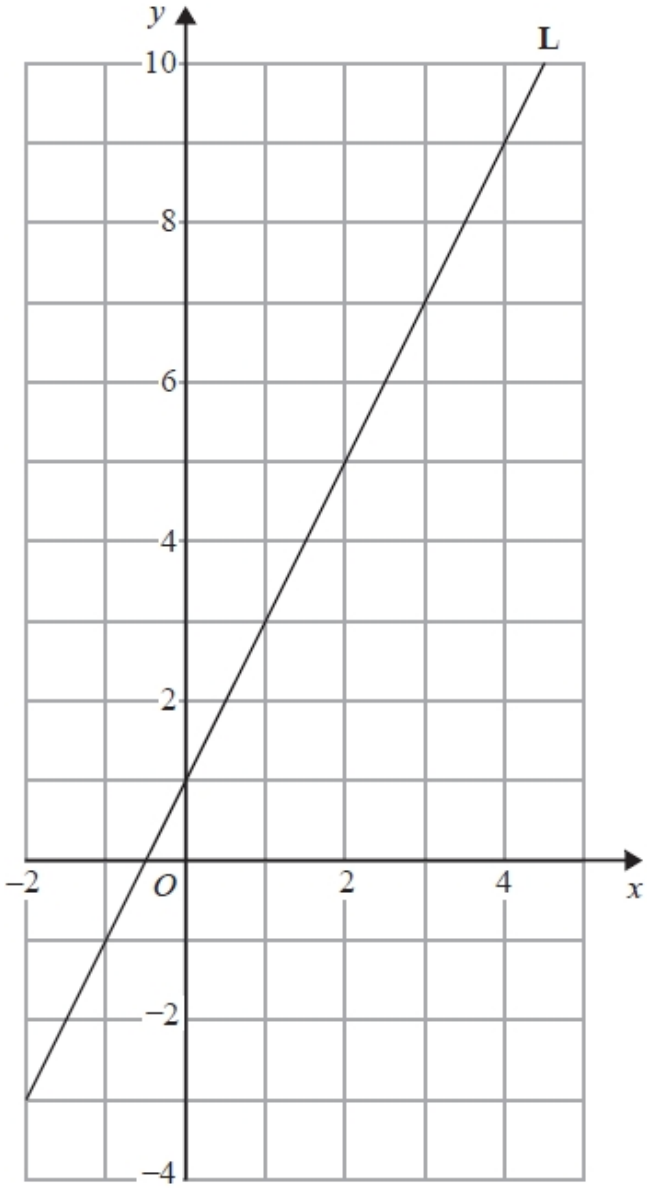
On the grid above, draw the line $x = 3$

Q3. Complete the table of values for $y = 2x + 5$.
Then draw the graph of $y = 2x + 5$ for values of x from $x = -2$ to $x = 2$ on the grid.

x	–2	–1	0	1	2
y	1		5	7	



Q4. This is the graph of $y = 2x + 1$ for $-2 \leq x \leq 5$.
Use the graph to estimate the value of y when $x = 1.4$.



Q5. What is the gradient of the line with equation $y = 4x - 3$?

Q6. Here are the equations of five straight lines.
Which of lines A–D is parallel to line L?

Line L $y = 2x + 4$

Line A $y = -2x + 4$

Line B $y = 2x + 3$

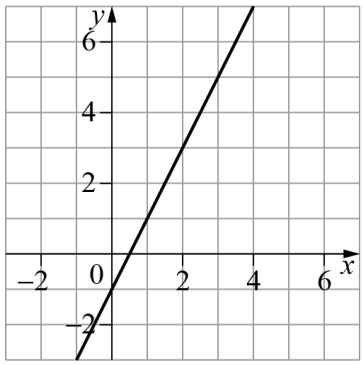
Line C $y = \frac{1}{2}x - 4$

Line D $y = -2x + 3$

Q7. Sketch the graph of $y = -\frac{1}{2}x + 2$.

Show the coordinates of the intercepts with the axes.

Q8. Find the equation of this line.



Q9. Draw the graph of $4x + 5y = 20$

Q10. A line has gradient 2 and passes through the point (3, 4)

Find the equation of the line.

Topics listed in objectives

- Use function machines to find coordinates (i.e. given the input x, find the output y);
- Plot and draw graphs of $y = a$, $x = a$, $y = x$ and $y = -x$;
- Recognise straight-line graphs parallel to the axes;
- Recognise that equations of the form $y = mx + c$ correspond to straight-line graphs in the coordinate plane;
- Plot and draw graphs of straight lines of the form $y = mx + c$ using a table of values;
- Sketch a graph of a linear function, using the gradient and y-intercept;
- Identify and interpret gradient from an equation $y = mx + c$;
- Identify parallel lines from their equations;
- Plot and draw graphs of straight lines in the form $ax + by = c$;
- Find the equation of a straight line from a graph;
- Find the equation of the line through one point with a given gradient;
- Find approximate solutions to a linear equation from a graph.

Answers

Q1. (12, 10) and (80, 27)

Q2. line $x = 3$ drawn

Q3. when $x = -1$, $y = 3$; when $x = 2$, $y = 9$; correct graph drawn

Q4. $y = 3.8$

Q5. 4

Q6. B

Q7. sketch of graph of $y = -\frac{1}{2}x + 2$, with (0, 2) and (4, 0) marked

Q8. $y = 2x - 1$

Q9. correct graph drawn, through (0, 4) and (5, 0)

Q10. $y = 2x - 2$