

Answer **all** questions in the spaces provided.

- 1** Circle the calculation that increases 400 by 7% **[1 mark]**

400×0.07

400×0.7

400×1.07

400×1.7

- 2** Simplify $3^4 \times 3^4$
Circle the answer. **[1 mark]**

3^8

9^8

3^{16}

9^{16}

- 3** Circle the area that is the same as 5.5 m^2 **[1 mark]**

550 cm^2

$5\,500 \text{ cm}^2$

$55\,000 \text{ cm}^2$

$5\,500\,000 \text{ cm}^2$

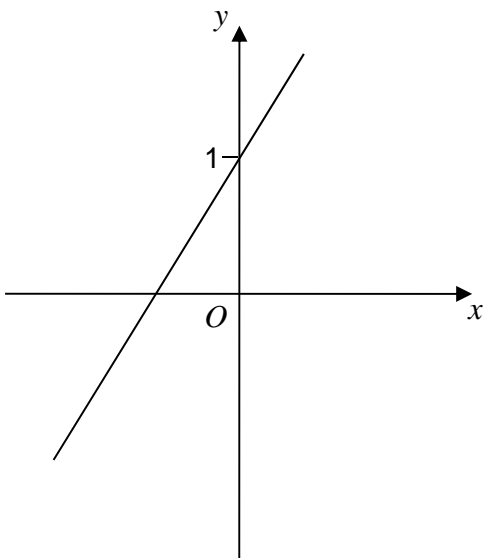
4 One of these graphs is a sketch of $y = 1 - 2x$

Which one?

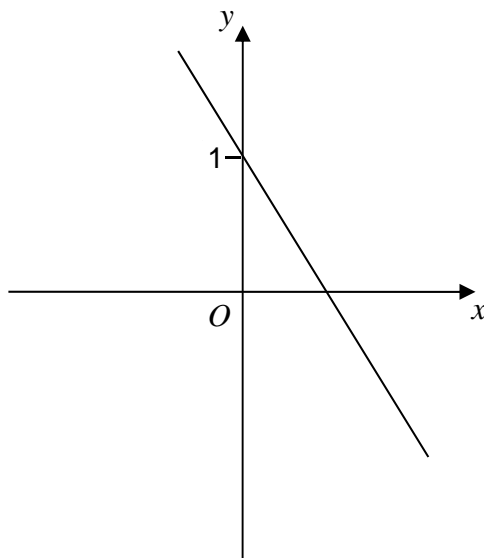
Circle the correct letter.

[1 mark]

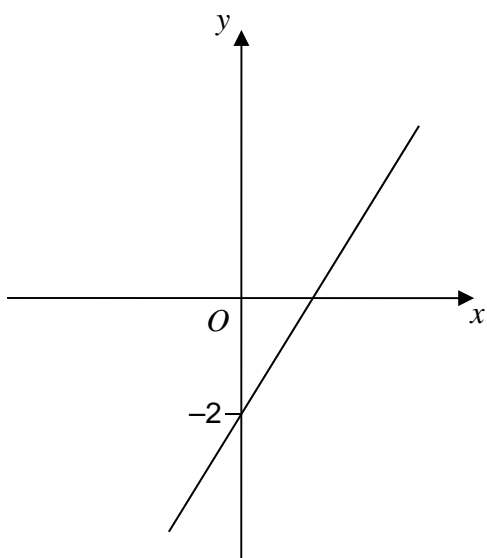
A



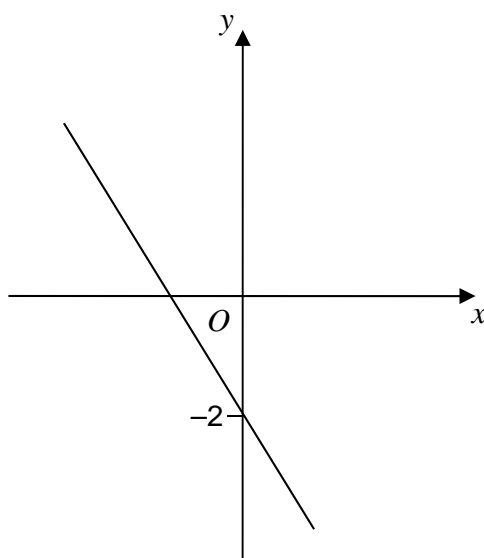
B



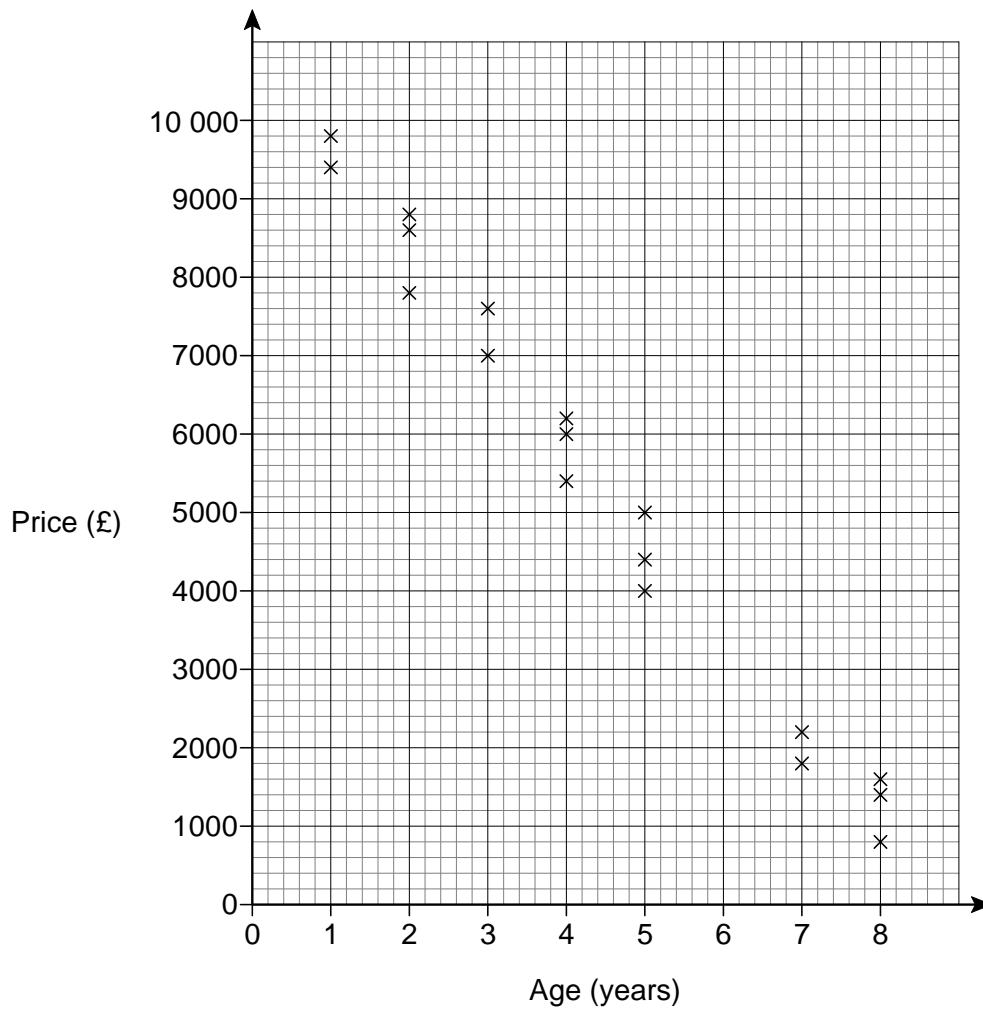
C



D



- 5 The scatter graph shows the age and the price of 18 cars.
The cars are all the same make and model.



Use a line of best fit to estimate the price of a 6-year old car.

[2 marks]

Answer £ _____

- 6 Kelly is trying to work out the two values of w for which $3w - w^3 = 2$
Her values are 1 and -1

Are her values correct?

You **must** show your working.

[2 marks]

- 7 Work out $2\frac{3}{4} \times 1\frac{5}{7}$

Give your answer as a mixed number in its simplest form.

[3 marks]

Answer _____

8 Solve $5x - 2 > 3x + 11$

[2 marks]

Answer _____

9 The n th term of a sequence is $2n + 1$
The n th term of a different sequence is $3n - 1$

Work out the **three** numbers that are

in both sequences

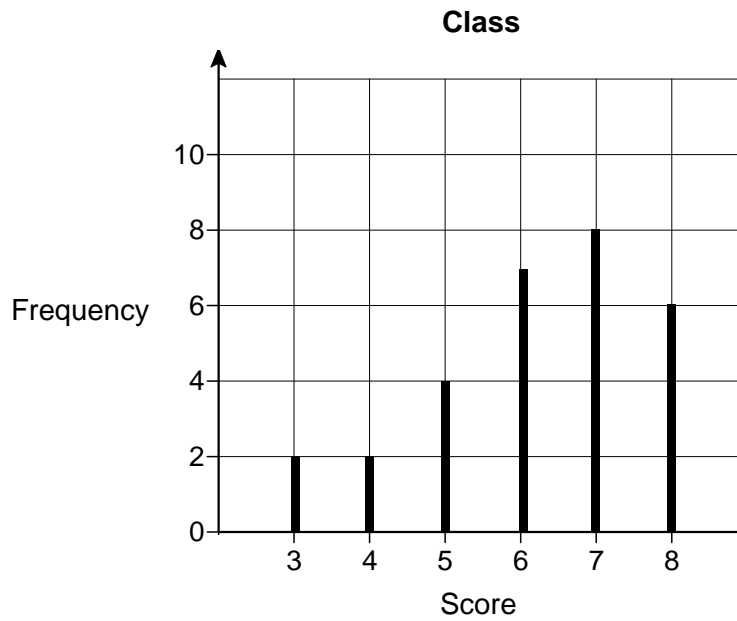
and

between 20 and 40

[3 marks]

Answer _____, _____, _____

- 11 Students in a class took a spelling test.
The diagram shows information about the scores.



Lucy is one of the 29 students in the class.
Her score was the same as the **median** score for her class.

Work out her score.

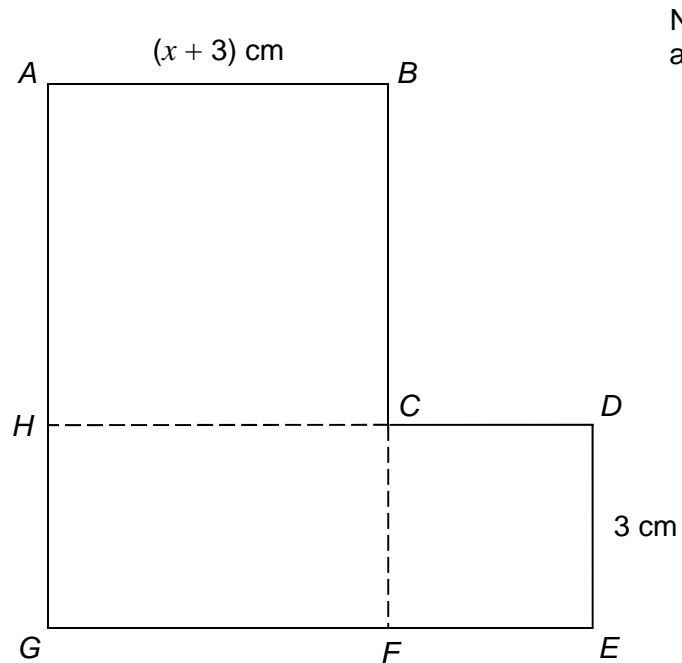
[2 marks]

Answer _____

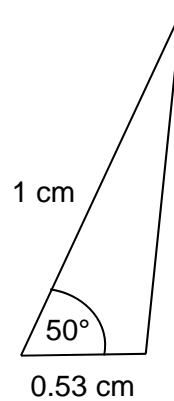
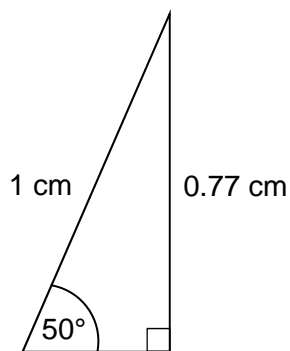
12

 $ABCH$ is a square. $HCFG$ is a rectangle. $CDEF$ is a square.

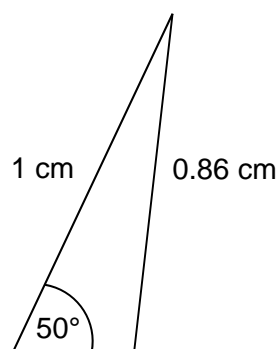
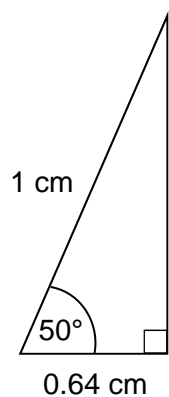
They are joined to make an L-shape.

Not drawn
accuratelyShow that the total area of the L-shape, in cm^2 , is $x^2 + 9x + 27$ **[4 marks]**

13 Here are sketches of four triangles.



Not drawn accurately



In each triangle

the longest side is **exactly** 1 cm

the other length is given to 2 decimal places.

13 (a) Circle the value of $\cos 50^\circ$ to 2 decimal places.

[1 mark]

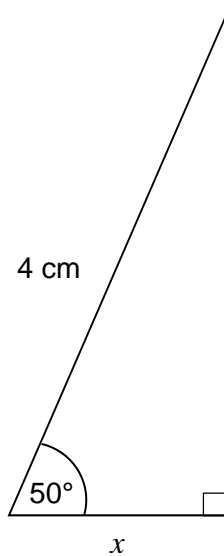
0.77

0.53

0.64

0.86

- 13 (b)** Work out the value of x .
Give your answer to 1 decimal place.



Not drawn
accurately

[2 marks]

Answer _____ cm

Turn over for the next question

- 14** A prime number between 300 and 450 is chosen at random.
The table shows the probability that the number lies in different ranges.

Prime number, n	Probability
$300 \leq n < 330$	0.16
$330 \leq n < 360$	0.24
$360 \leq n < 390$	x
$390 \leq n < 420$	0.16
$420 \leq n < 450$	0.24

- 14 (a)** Work out the value of x .

[2 marks]

Answer _____

- 14 (b)** Work out the probability that the prime number is greater than 390

[1 mark]

Answer _____

14 (c) There are four prime numbers between 300 and 330

How many prime numbers are there between 300 and 450?

[2 marks]

Answer _____

15 $a \times 10^4 + a \times 10^2 = 24\,240$ where a is a number.

Work out $a \times 10^4 - a \times 10^2$

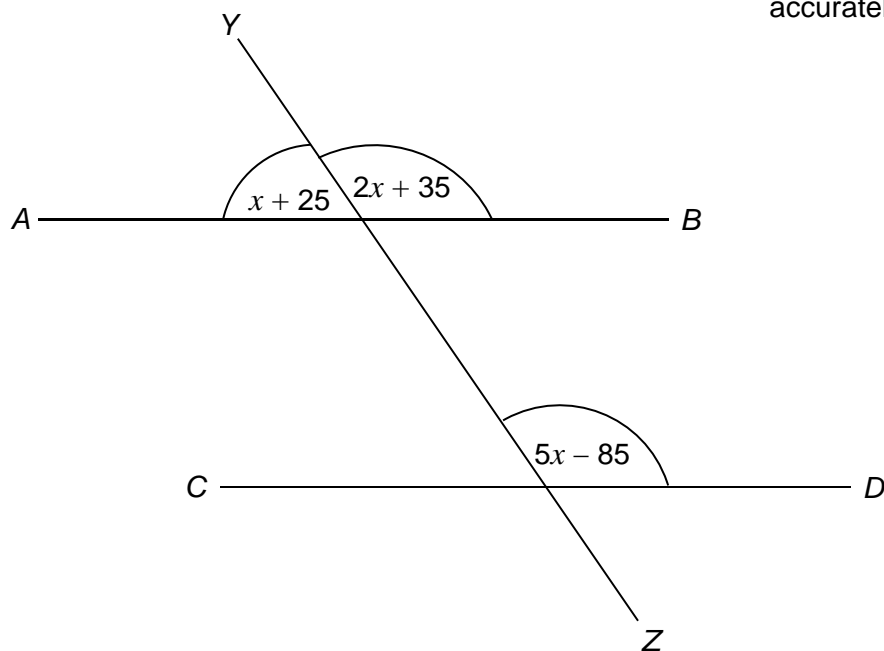
Give your answer in standard form.

[2 marks]

Answer _____

- 16 AB , CD and YZ are straight lines.
All angles are in degrees.

Not drawn accurately



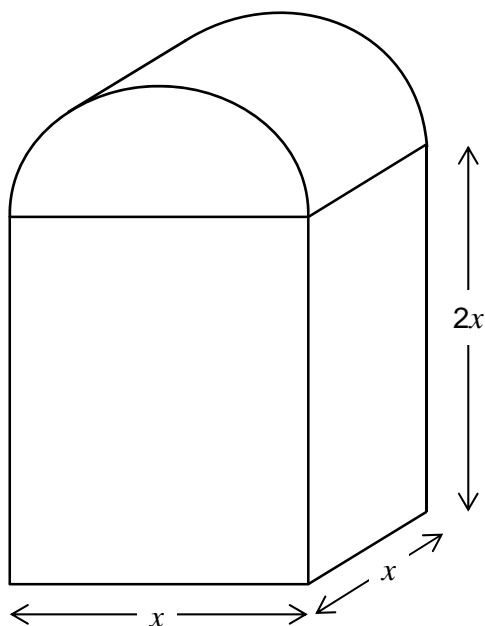
Show that AB is parallel to CD .

[4 marks]

18 In this question all dimensions are in centimetres.

A solid has uniform cross section.

The cross section is a rectangle and a semicircle joined together.



Work out an expression, in cm^3 , for the **total** volume of the solid.

Write your expression in the form $ax^3 + \frac{1}{b}\pi x^3$ where a and b are integers.

[4 marks]

Answer _____ cm^3

- 19** Show that $12 \cos 30^\circ - 2 \tan 60^\circ$ can be written in the form \sqrt{k} where k is an integer.

[3 marks]

Turn over for the next question

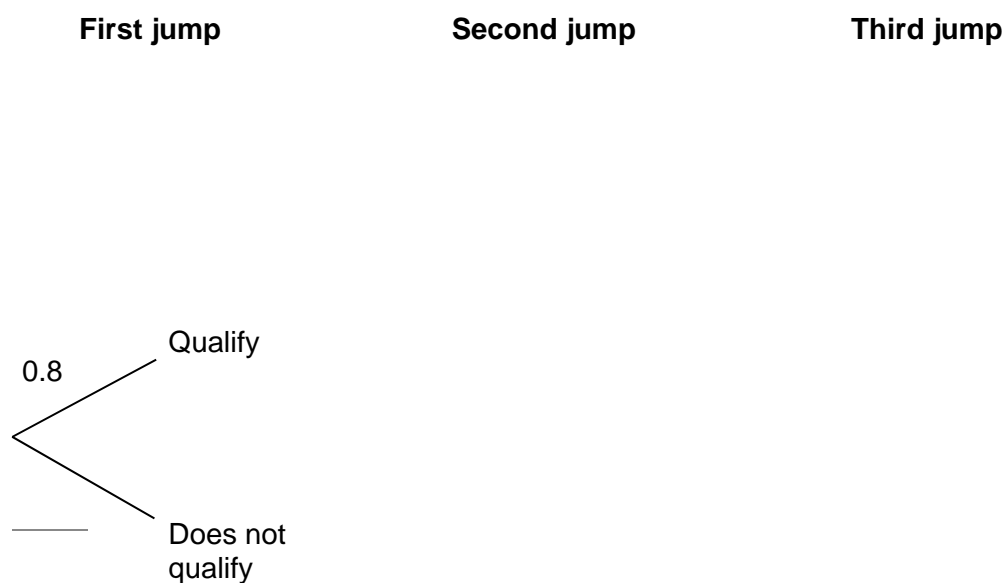
20 On Friday, Greg takes part in a long jump competition.
He has to jump at least 7.5 metres to qualify for the final on Saturday.

- He has up to three jumps to qualify.
- If he jumps at least 7.5 metres he does **not** jump again on Friday.

Each time Greg jumps, the probability he jumps at least 7.5 metres is 0.8
Assume each jump is independent.

20 (a) Complete the tree diagram.

[2 marks]



20 (b) Work out the probability that he does **not** need the third jump to qualify.

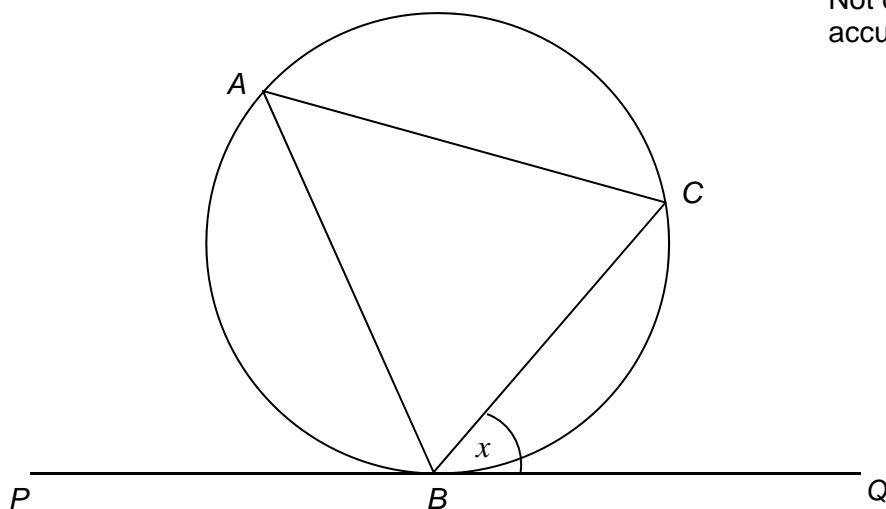
[2 marks]

Answer _____

21 A , B and C are points on a circle.

- BC bisects angle ABQ .
- PBQ is a tangent to the circle.

Not drawn
accurately



Angle $CBQ = x$

Prove that $AC = BC$

[3 marks]

Turn over for the next question

22 Steph is solving a problem.

Cube A has a surface area of 150 cm^2

Cube B has sides half the length of cube A

What is the volume of cube B?

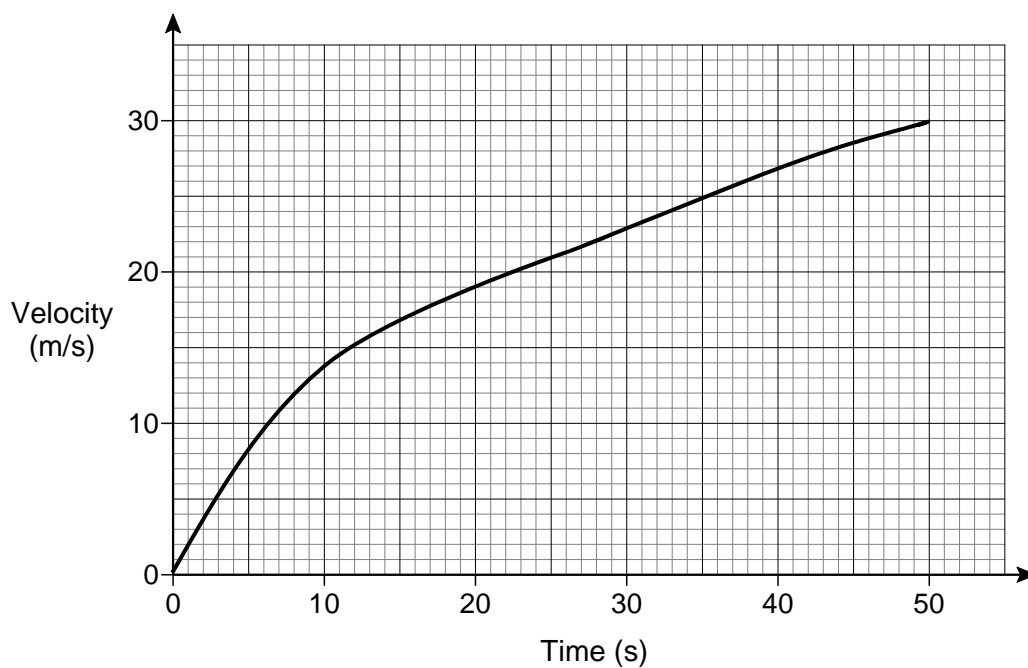
To solve this problem, Steph decides to

- halve the surface area
- calculate the square root of the answer
- then divide by 6
- then cube this answer to work out the volume.

Evaluate Steph's method.

[2 marks]

24 Here is the velocity-time graph of a car for 50 seconds.



24 (a) Work out the average acceleration during the 50 seconds.

Give the units of your answer.

[2 marks]

Answer _____

24 (b) Estimate the time during the 50 seconds when

the instantaneous acceleration = the average acceleration

You **must** show your working on the graph.

[2 marks]

Answer _____ seconds

25

$$f(x) = 2x + c$$

$$g(x) = cx + 5$$

$$fg(x) = 6x + d$$

c and d are constants.

Work out the value of d .

[3 marks]

Answer _____

Turn over for the next question

26 Rationalise the denominator and simplify $\frac{10}{3\sqrt{5}}$

[2 marks]

Answer _____

27 Convert $0.1\dot{7}\dot{2}$ to a fraction in its lowest terms.

[3 marks]

Answer _____

There are no questions printed on this page

**DO NOT WRITE ON THIS PAGE
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