



Surname \_\_\_\_\_

Forename(s) \_\_\_\_\_

Centre Number \_\_\_\_\_

Candidate Number \_\_\_\_\_

Candidate Signature \_\_\_\_\_

I declare this is my own work.

**GCSE**

**MATHEMATICS**

**F**

Foundation Tier      Paper 3    Calculator

**8300/3F**

**Monday 7 November 2022**

**Morning**

**Time allowed: 1 hour 30 minutes**

**At the top of the page, write your surname and forename(s), your centre number, your candidate number and add your signature.**

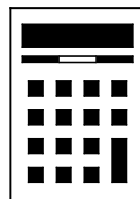
**[Turn over]**



**MATERIALS**

**For this paper you must have:**

- a calculator
- mathematical instruments
- the Formulae Sheet (enclosed).

**INSTRUCTIONS**

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer ALL questions.
- You must answer the questions in the spaces provided. Do not write on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.



**INFORMATION**

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

**ADVICE**

**In all calculations, show clearly how you work out your answer.**

**DO NOT TURN OVER UNTIL TOLD TO DO SO**



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

- 1      What is the CLOCKWISE turn from North to East?**

**Circle your answer. [1 mark]**

**$45^\circ$**

**$90^\circ$**

**$270^\circ$**

**$315^\circ$**

- 2       $d$  is 6 more than  $c$ .**

**Circle the correct equation. [1 mark]**

**$d = 6c$**

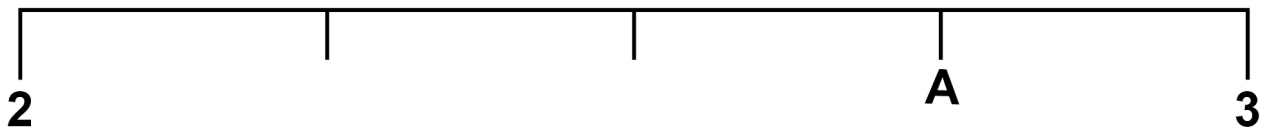
**$c = 6d$**

**$d = c + 6$**

**$c = d + 6$**



3 Here is a number line.



Which number is at A?

Circle your answer. [1 mark]

2.3

2.55

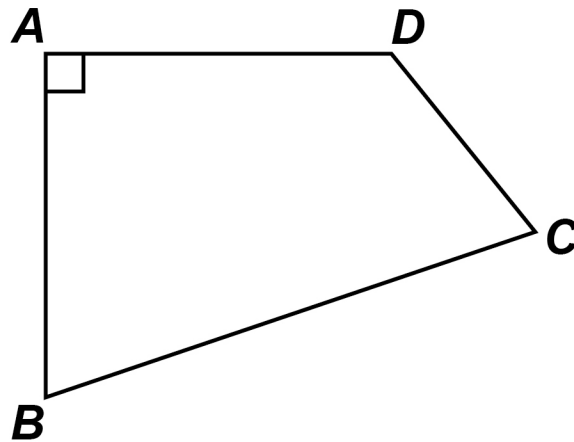
2.6

2.75

[Turn over]



- 4 In the quadrilateral, which angle is OBTUSE?



Circle your answer. [1 mark]

*ADC*

*BAD*

*CBA*

*DCB*

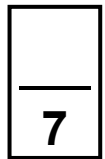
- 5 (a) Write down the TWO prime numbers between 25 and 35 [2 marks]

Answer \_\_\_\_\_ and \_\_\_\_\_

- 5 (b) Write down ONE cube number between 100 and 300 [1 mark]

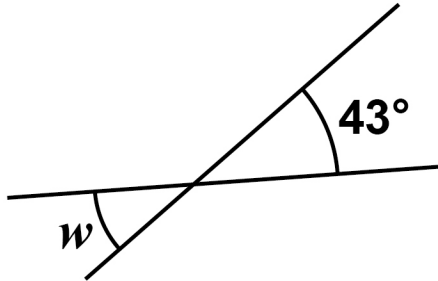
Answer \_\_\_\_\_

[Turn over]



6 (a) Here are two straight lines.

The diagram is not drawn accurately.

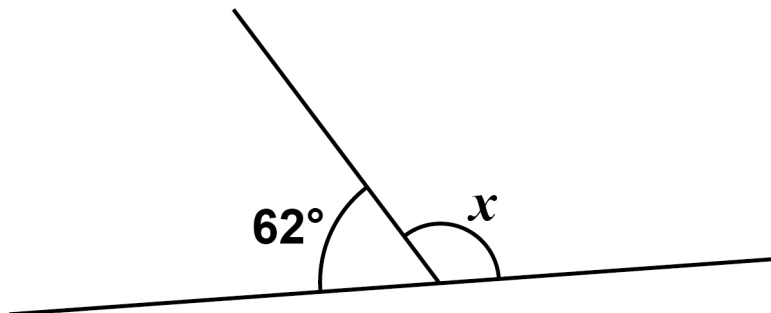


Write down the size of angle  $w$ . [1 mark]

$w =$  \_\_\_\_\_ degrees

6 (b) Here are two different straight lines.

The diagram is not drawn accurately.



Work out the size of angle  $x$ . [1 mark]



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$x =$  \_\_\_\_\_ degrees

**6 (c) In a triangle, two of the angles are  $51^\circ$  and  $74^\circ$ .**

**Work out the size of the third angle. [1 mark]**

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**Answer** \_\_\_\_\_ **degrees**

**[Turn over]**



7 (a) Solve  $12 - e = 0$  [1 mark]

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$e =$  

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7 (b) Solve  $7f = 0$  [1 mark]

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$f =$  

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- 8 Put these probabilities in order, starting with the LEAST likely.

72%

0.705

 $\frac{7}{10}$ 

[2 marks]

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Answer \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_

[Turn over]

7



9

$x$	0	2	4	6	8	
$y$	3	7	11		19	23

The  $x$ -values in the table make a linear sequence.

The  $y$ -values in the table make a different linear sequence.

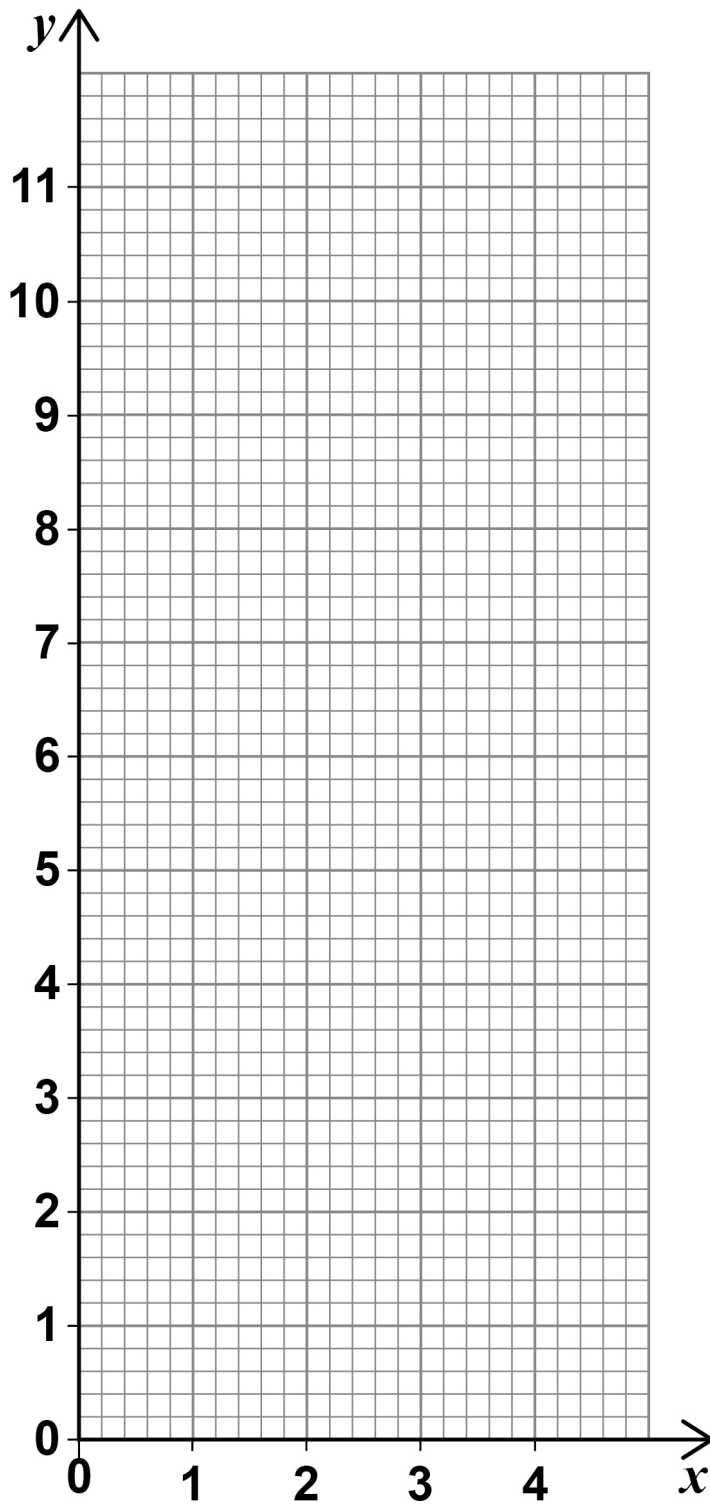
9 (a) Complete the table. [2 marks]

9 (b) On the opposite page, draw a straight line passing through the points (0, 3), (2, 7) and (4, 11) [2 marks]

9 (c) Use the graph, on the opposite page, to work out the value of  $y$  when  $x = 3$  [1 mark]

$y =$  \_\_\_\_\_





[Turn over]



- 10 (a) When 5 is added to a negative number, the answer can be POSITIVE**

**Give ONE example to show that this is correct.  
[1 mark]**

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- 10 (b) When 5 is added to a negative number, the answer can be NEGATIVE**

**Give ONE example to show that this is correct.  
[1 mark]**

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- 10 (c) When a number is doubled, the answer is always greater than the original number**

**Give ONE example to show that this is NOT correct. [1 mark]**

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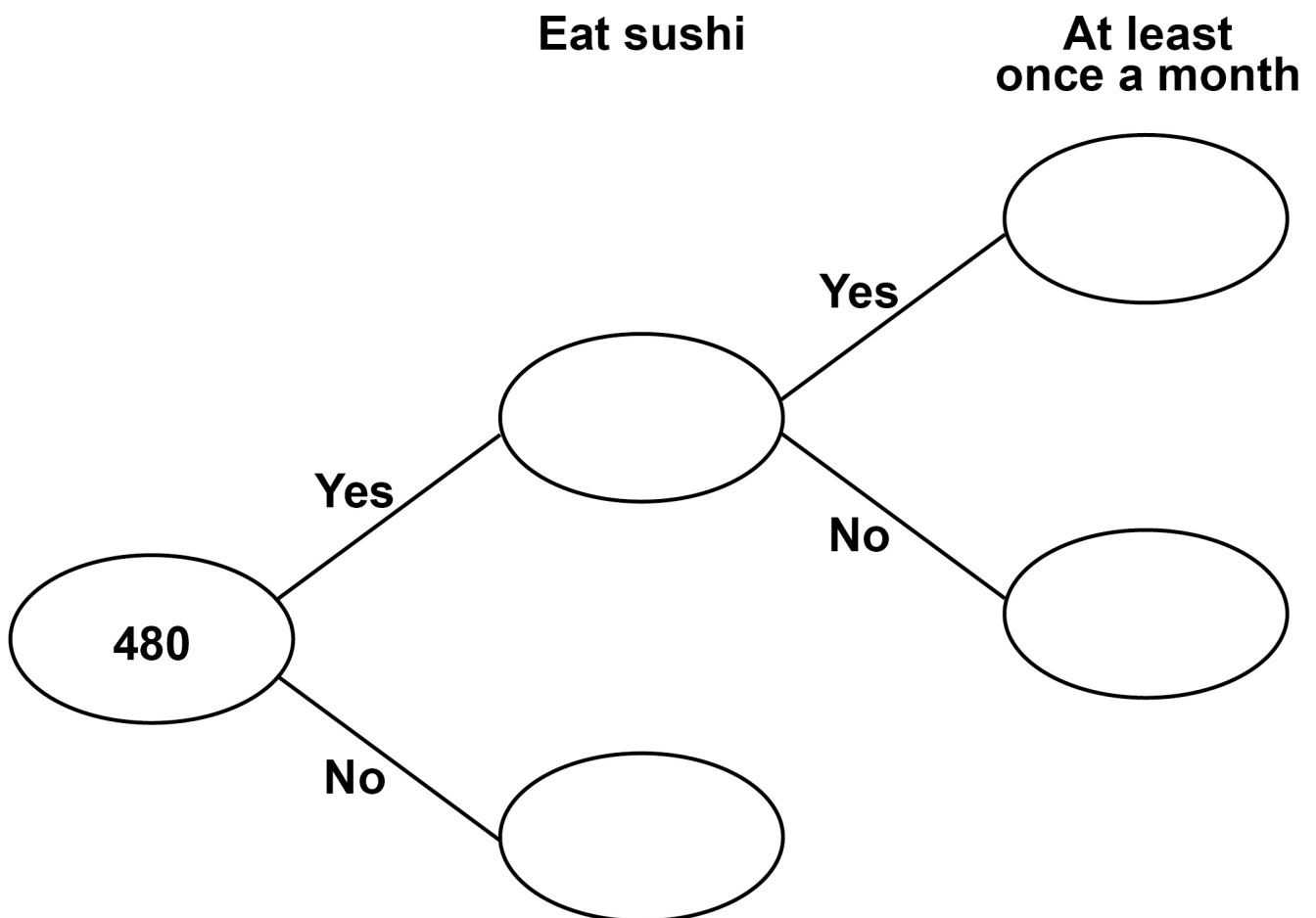
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**[Turn over]**

8

- 11 480 people are asked if they eat sushi.  
20% say Yes.  
 $\frac{2}{3}$  of the people who say Yes eat sushi at least once a month.  
Complete the frequency tree. [4 marks]





- 12**      **Event A has taken place every 4 years.**  
**Event B has taken place every 3 years.**  
**Both events took place in 2019**

**Work out the last year, before 2019, when both events took place. [2 marks]**

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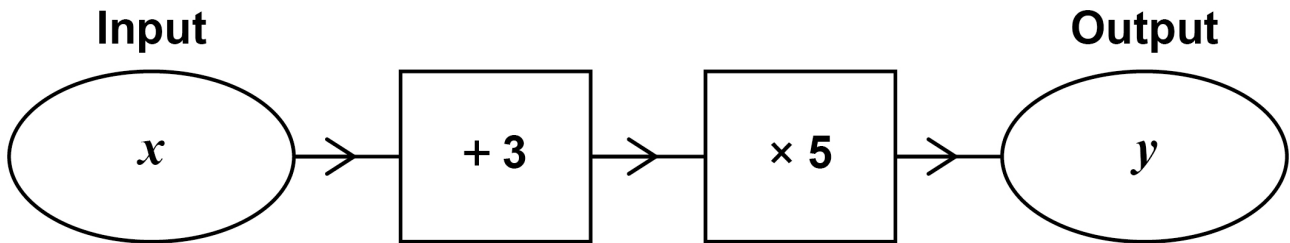
**Answer** \_\_\_\_\_

**[Turn over]**



- 13 Luke wants to make a number machine so that  $y = 5x + 3$

Here is his attempt.



What mistake has he made? [1 mark]

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**14      Circle the solid that has six edges. [1 mark]**

**triangular-based pyramid**

**sphere**

**cube**

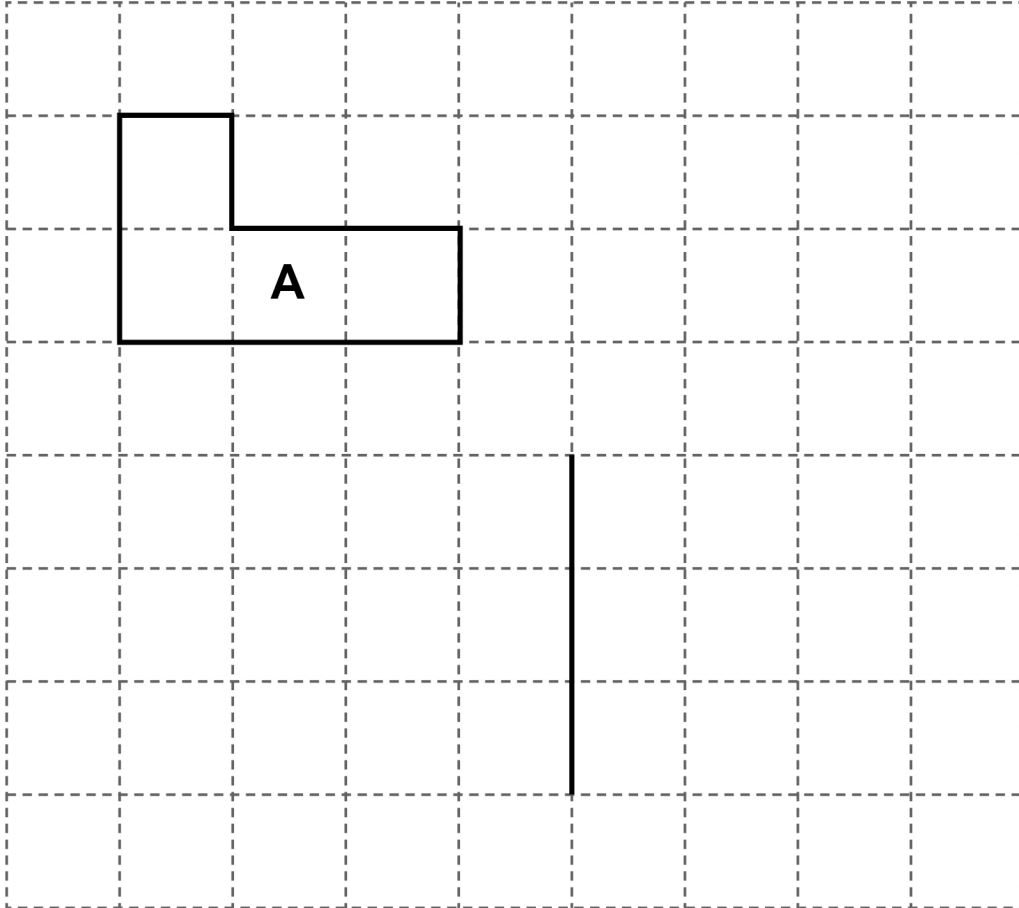
**cylinder**

**[Turn over]**



**15 (a) On the grid, shape A is shown.**

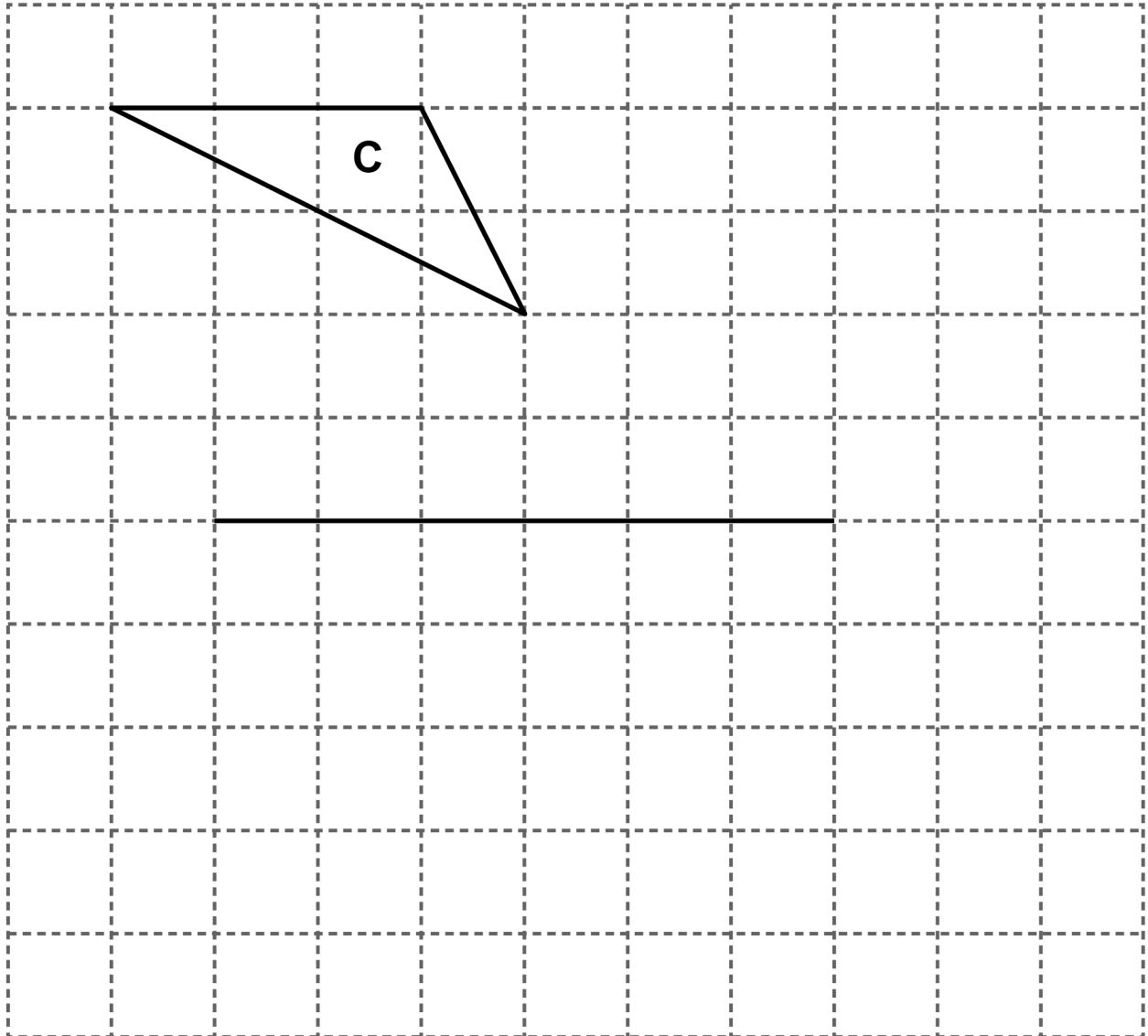
**One side of shape B is also shown.**



**Complete shape B so that it is congruent to shape A. [1 mark]**

15 (b) On this grid, shape C is shown.

One side of shape D is also shown.



Complete shape D so that it is an enlargement of shape C with scale factor 2 [1 mark]

[Turn over]

- 16**      **40 students were asked the number of visits they made to a gym one week.**

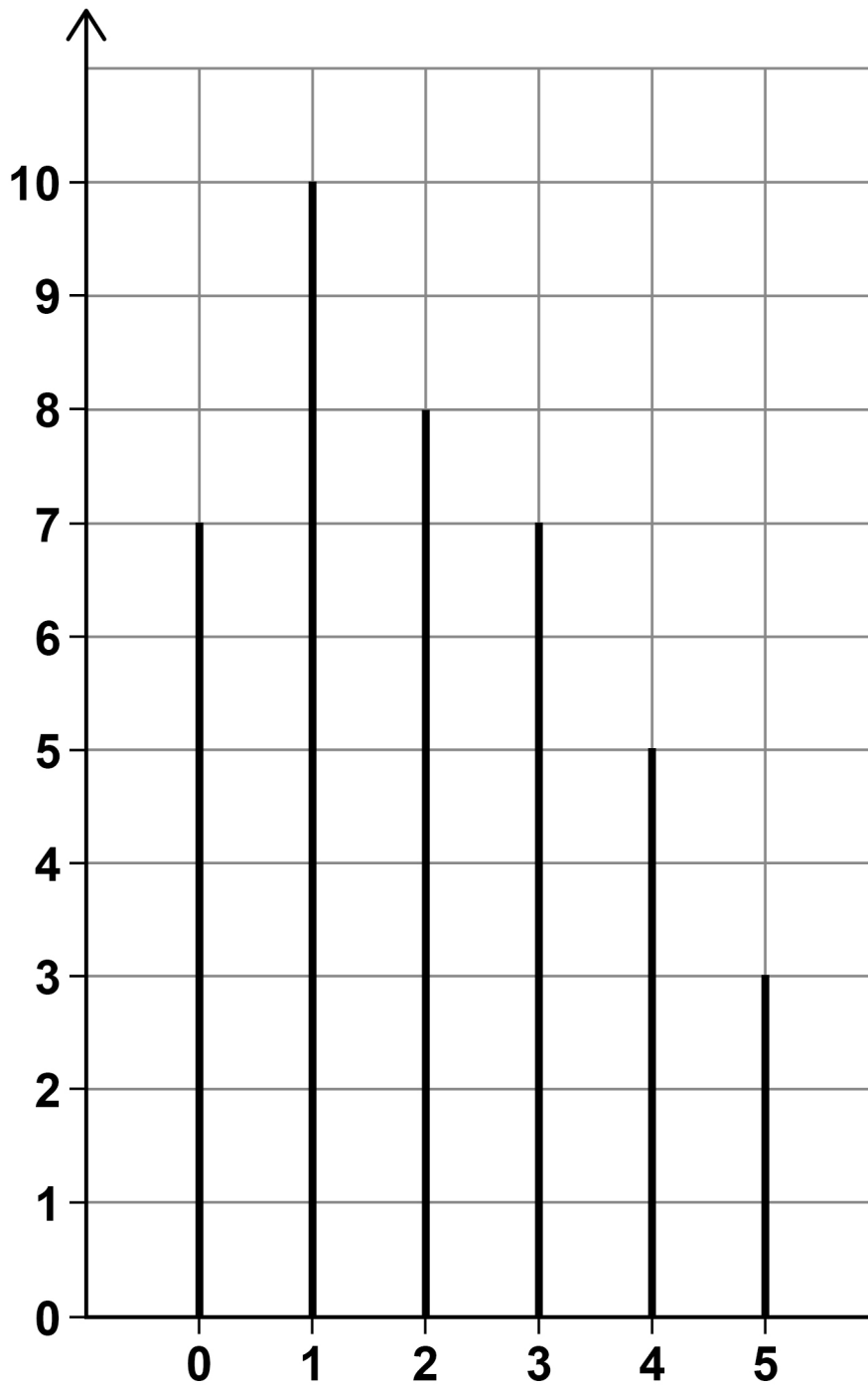
**The chart, on the opposite page, shows information about the results.**

- 16 (a) Write down the modal number of visits.  
[1 mark]**

**Answer** \_\_\_\_\_



Number of  
students



Number of visits

[Turn over]



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**16 (b) Work out the mean number of visits.**

**Give your answer as a decimal. [3 marks]**

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**Answer** \_\_\_\_\_

**[Turn over]**



16 (c) One of the 40 students is chosen at random.

Work out the probability that the student visited the gym AT LEAST once. [2 marks]

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Answer \_\_\_\_\_

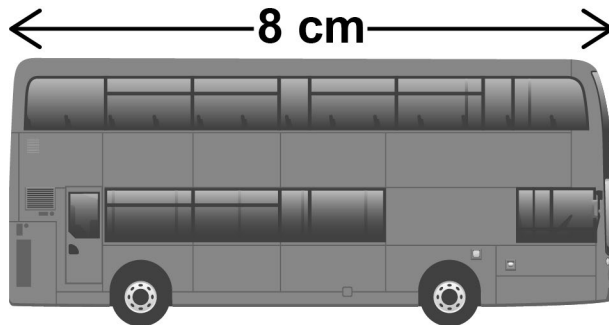
6

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**[Turn over]**



- 17 This scale drawing of a bus has length 8 cm



**SCALE** 1 cm represents 1.65 m

The actual length of the bus is 3.8 times the actual length of a car.

Work out the actual length of the car.

Give your answer in metres, to the nearest centimetre. [3 marks]

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**Answer** \_\_\_\_\_ **metres**

**[Turn over]**

- 18      11 identical full tins of red paint hold a total of 3630 ml

All the paint from 4 of these tins is poured into an empty bucket.

The bucket can hold 2500 ml

Tins of white paint each hold 140 ml

Can all the white paint from 9 tins be added to the bucket?

You MUST show your working. [4 marks]

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19 The largest possible value of  $n$  is 2

Circle the correct inequality. [1 mark]

$n \leq 2$

$n < 2$

$n \geq 2$

$n > 2$

[Turn over]

8



**20 Jamil is on holiday in France.**

**20 (a) The cost of a room in a hostel is 27 euros.**

**Convert the cost to £**

**Use £1 = 1.2 euros [2 marks]**

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**Answer £** \_\_\_\_\_





20 (b) Jamil rides a motorbike.

The motorbike uses one litre of petrol for every 14 miles.

How many litres of petrol does the motorbike use to go 168 kilometres?

Use 8 kilometres = 5 miles [3 marks]

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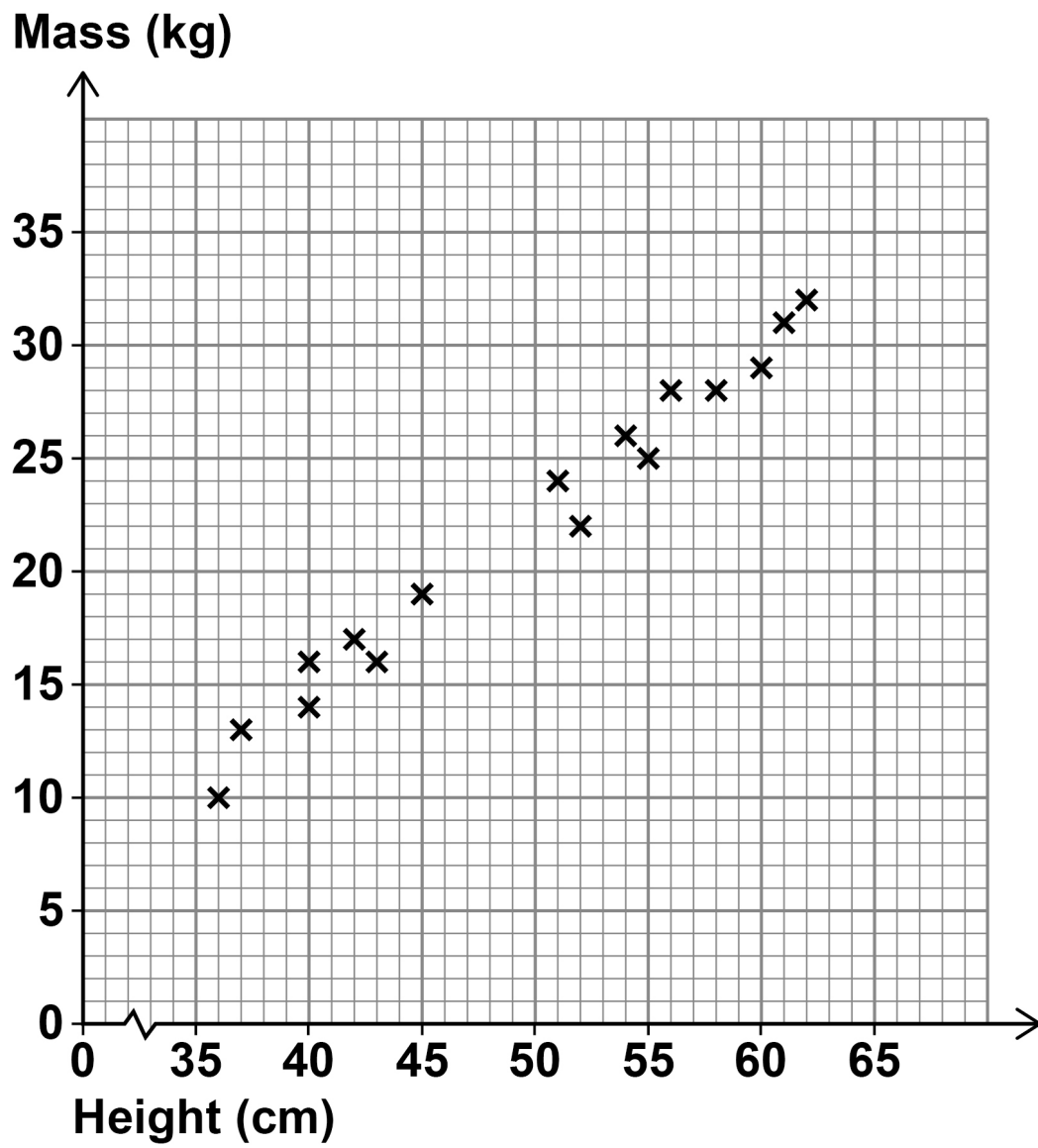
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Answer \_\_\_\_\_ litres

[Turn over]



- 21 The scatter graph shows the height and mass of some dogs.



**21 (a) The scatter graph shows positive correlation.**

**Describe the relationship between the height and mass of the dogs. [1 mark]**

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**21 (b) Use a line of best fit to estimate the mass of a dog with height 48 cm [2 marks]**

**Answer** \_\_\_\_\_ **kg**

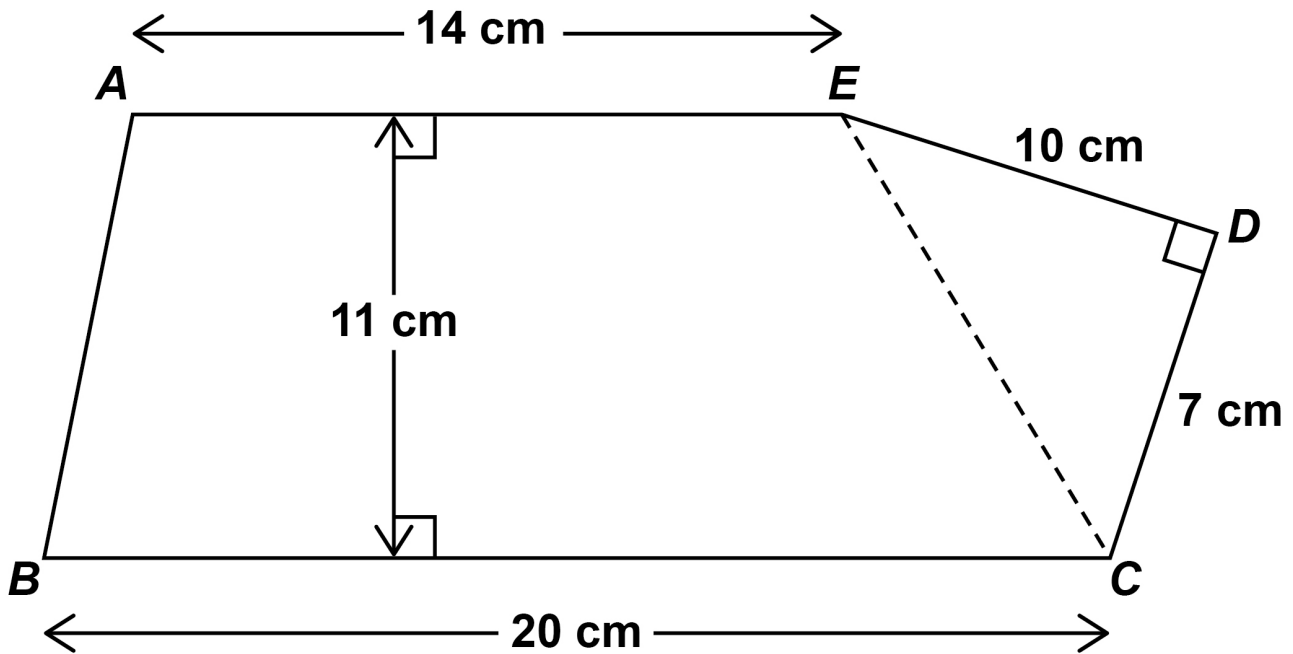
**[Turn over]**

8



22 *ABCDE* is a pentagon.

The diagram is not drawn accurately.



Work out the area of the pentagon. [3 marks]

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**Answer** \_\_\_\_\_ **cm<sup>2</sup>**

**[Turn over]**



- 23 Joe, Kim and Lisa each have an amount of money.**

**Joe has £72**

**Joe's amount : Kim's amount = 6 : 5**

**Lisa's amount is  $1\frac{1}{2}$  times Joe's amount.**

**Show that, in total, they have LESS than £250  
[3 marks]**

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[Turn over]

6



**24 A solid statue has volume  $512 \text{ cm}^3$**

**The statue has mass 3.6 kilograms.**

**density of iron = 7.87 grams per cubic centimetre**

**Is the statue made of iron?**

**You MUST show your working. [3 marks]**

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**[Turn over]**



**25 (a) Here is the rule for a sequence.**

**After the first two terms, each term is the sum of the previous two terms**

**The 1st term is 33**

**The 2nd term is  $x$**

**The 4th term is 73**

**Work out the value of  $x$ . [3 marks]**

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**$x =$**  \_\_\_\_\_



25 (b) An expression for the  $n$ th term of a different sequence is  $n - n^2$

Ruth says,

“All the terms will be negative because  $n^2$  is always greater than  $n$ .”

Is she correct?

Tick a box.

☐

Yes

☐

No

Give a reason for your answer. [1 mark]

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[Turn over]

7



26  $P$  and  $Q$  are points.

The  $x$ -coordinate of  $Q$  is 4 MORE than the  $x$ -coordinate of  $P$ .

The  $y$ -coordinate of  $Q$  is 5 LESS than the  $y$ -coordinate of  $P$ .

Work out the gradient of the straight line through  $P$  and  $Q$ . [2 marks]

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Answer \_\_\_\_\_



27  $m = pr$

$p$  is halved and  $r$  is multiplied by 3

What happens to  $m$  ?

Circle your answer. [1 mark]

$\times 6$

$\times \frac{1}{6}$

$\times \frac{3}{2}$

$\times \frac{2}{3}$

[Turn over]



**28 Here are the results after 250 spins of a coin.**

<b>HEADS</b>	<b>128</b>
<b>TAILS</b>	<b>122</b>

**The coin is spun an extra 50 times.**

**After all 300 spins, the relative frequency of Heads is 0.49**

**For the EXTRA 50 SPINS, work out  
number of Heads : number of Tails [3 marks]**

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Answer \_\_\_\_\_ :

- 29 Circle the equation where  $c$  is inversely proportional to  $d$ . [1 mark]

$$c = \frac{1}{2}d$$

$$c = \frac{2}{d}$$

$$c = -2d$$

$$c = -\frac{2}{d^2}$$

[Turn over]

<div style="border-bottom: 1px solid black; height: 10px; width: 100%;"></div> <div style="margin-top: 5px;">7</div>
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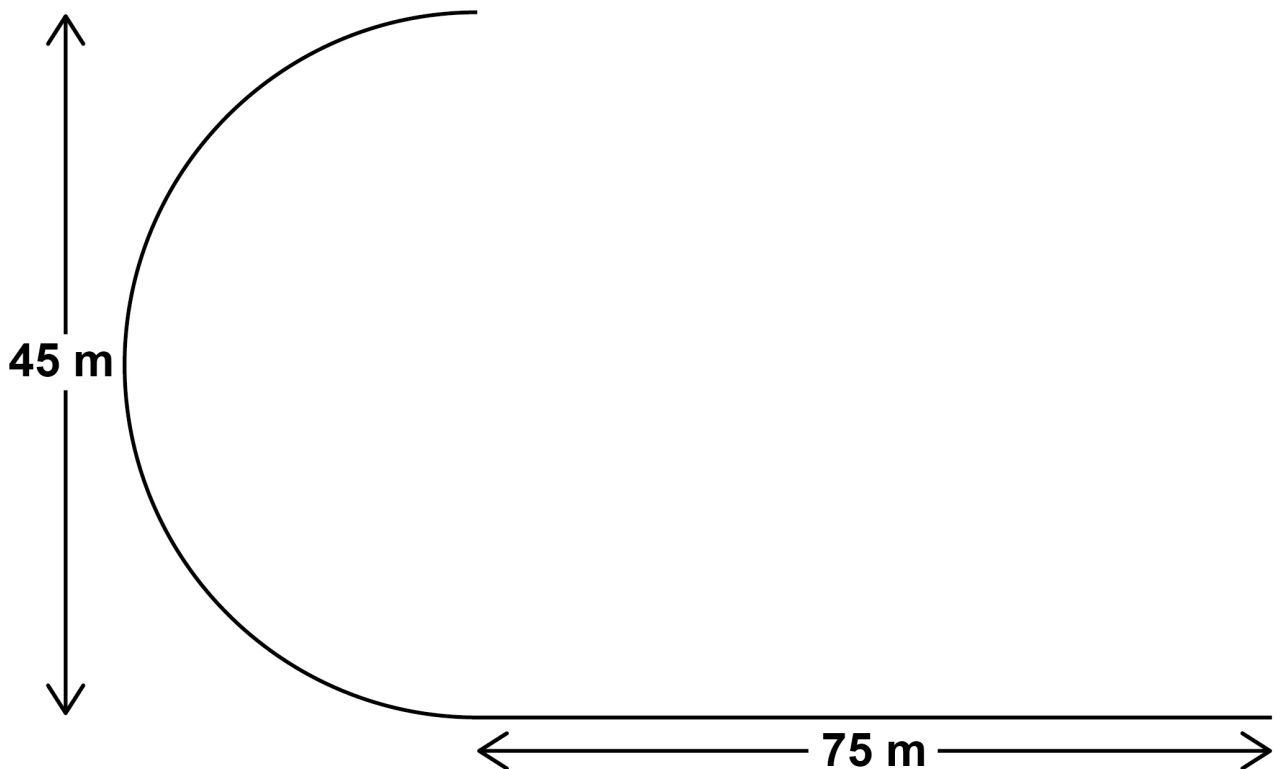


- 30** Part of a running track is the arc of a semicircle joined to a straight line.

The semicircle has diameter 45 metres.

The straight line has length 75 metres.

The diagram is not drawn accurately.



Abby runs once along this part of the track in 18 seconds.

Work out her average speed.

Give your answer to 2 significant figures.  
[4 marks]



[illegible]

**Answer** \_\_\_\_\_ **m/s**

**[Turn over]**



- 31 Here is some information about the members of clubs A and B.

	Number of members	Mean height of members
CLUB A	24	1.8 m
CLUB B	20	1.92 m

Work out  $\frac{\text{total height of the members of club A}}{\text{total height of the members of club B}}$

Give your answer as a decimal. [2 marks]

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Answer 

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END OF QUESTIONS

6



**Additional page, if required.**

**Write the question numbers in the left-hand margin.**

[illegible]

**Additional page, if required.**

**Write the question numbers in the left-hand margin.**

[illegible]

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For Examiner's Use	
Pages	Mark
4–7	
8–11	
12–15	
16–18	
19–21	
22–26	
28–31	
32–35	
36–39	
40–43	
44–47	
48–51	
<b>TOTAL</b>	

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