AQA

Surname _____

Other Names _____

Centre Number _____

Candidate Number _____

Candidate Signature _____

GCSE MATHEMATICS

H

Higher Tier Paper 2 Calculator

8300/2H

Thursday 8 June 2017 Morning

Time allowed: 1 hour 30 minutes

For this paper you must have:
- **a calculator**
- **mathematical instruments.**

At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.

[Turn over]

J U N 1 7 8 3 0 0 / 2 H 0 1

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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.**
- **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 Circle the decimal that is closest in value to $\frac{39}{800}$ [1 mark]

0·04 0·048 0·049 0·05

2 Circle the area that is equal to 36 mm^2 [1 mark]

360 cm^2 3600 cm^2 3·6 cm^2 0·36 cm^2

3 *A* is (2, 12) and *B* is (8, 2)

Circle the midpoint of *AB*. [1 mark]

(3, 5) (4, 6) (5, 7) (6, 10)

4 Here is a sequence.

90 82 74 66 58

Circle the expression for the nth term of the sequence. [1 mark]

$n - 8$ $98 - 8n$ $8n + 82$ $8n - 98$

4

5 A code has 4 digits.

Each digit is a number from 0 to 9

Digits may be repeated.

The code starts 5 4 1

5 (a) Amy knows the last digit is odd but NOT 7

She chooses a different odd number at random.

What is the probability that she chooses the correct number? [1 mark]

Answer _____

[Turn over]

5 (b) **The 4-digit code is changed to an even number.**

The first digit is 3

How many possible codes are there?
[2 marks]

_____

_____

_____

_____

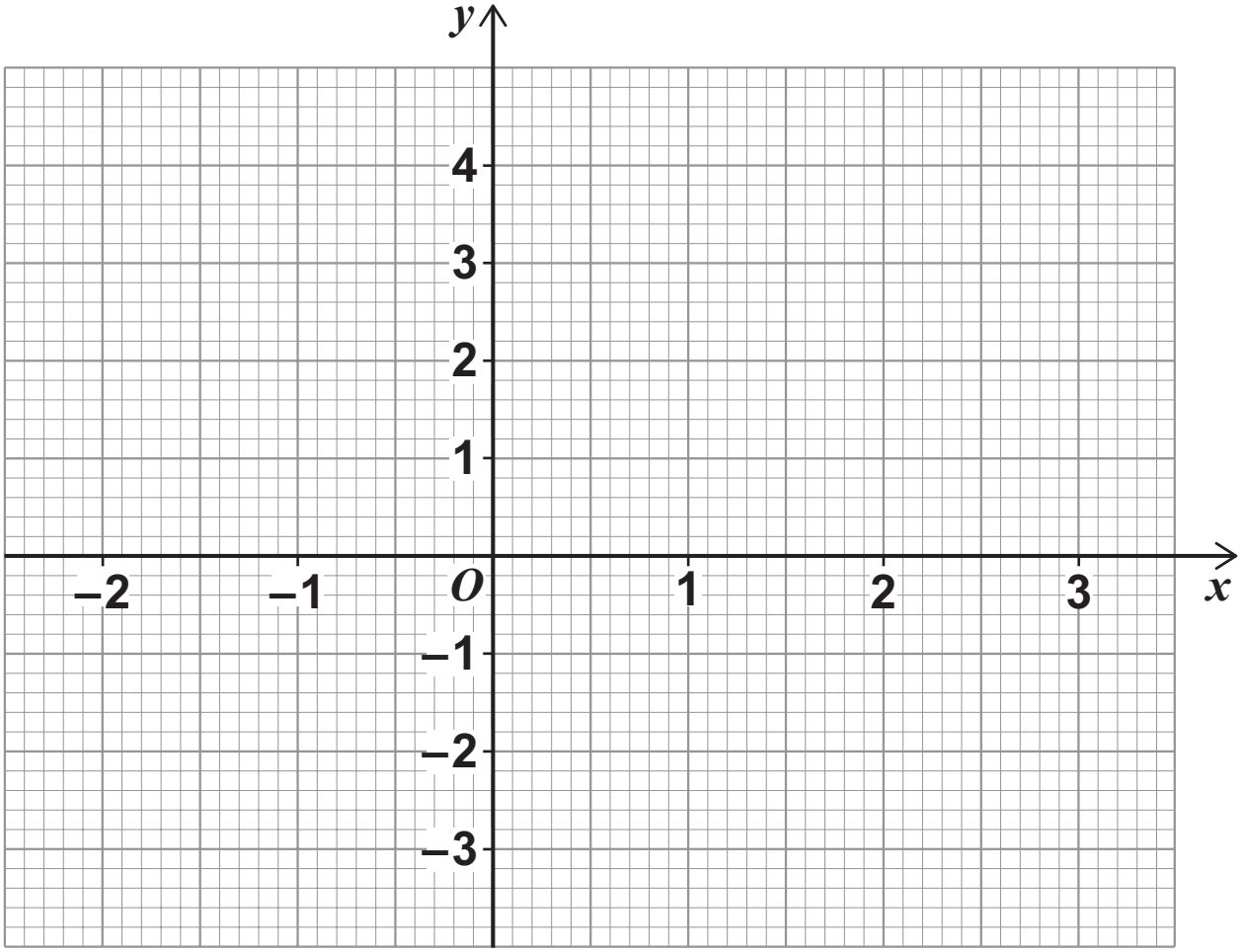
_____

Answer _____

6 (a) **Complete the table of values for** $y = x^2 - x - 2$
[2 marks]

x	–2	–1	0	1	2	3
y			–2	–2		4

6 (b) Draw the graph of $y = x^2 - x - 2$ for values of x from –2 to 3 [2 marks]



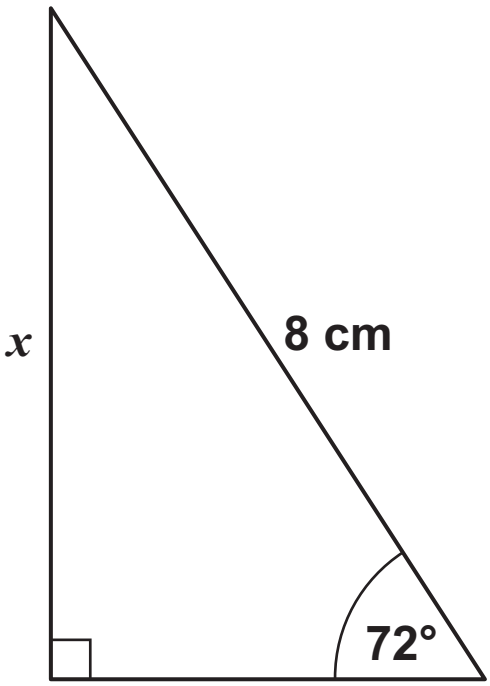
6 (c) Write down the x-coordinate of the turning point of the graph. [1 mark]

Answer _____

8

7 **Use trigonometry to work out the length x.**
[2 marks]

Not drawn accurately



_____

_____

Answer _____ **cm**

[Turn over]

8 Lily goes on a car journey.

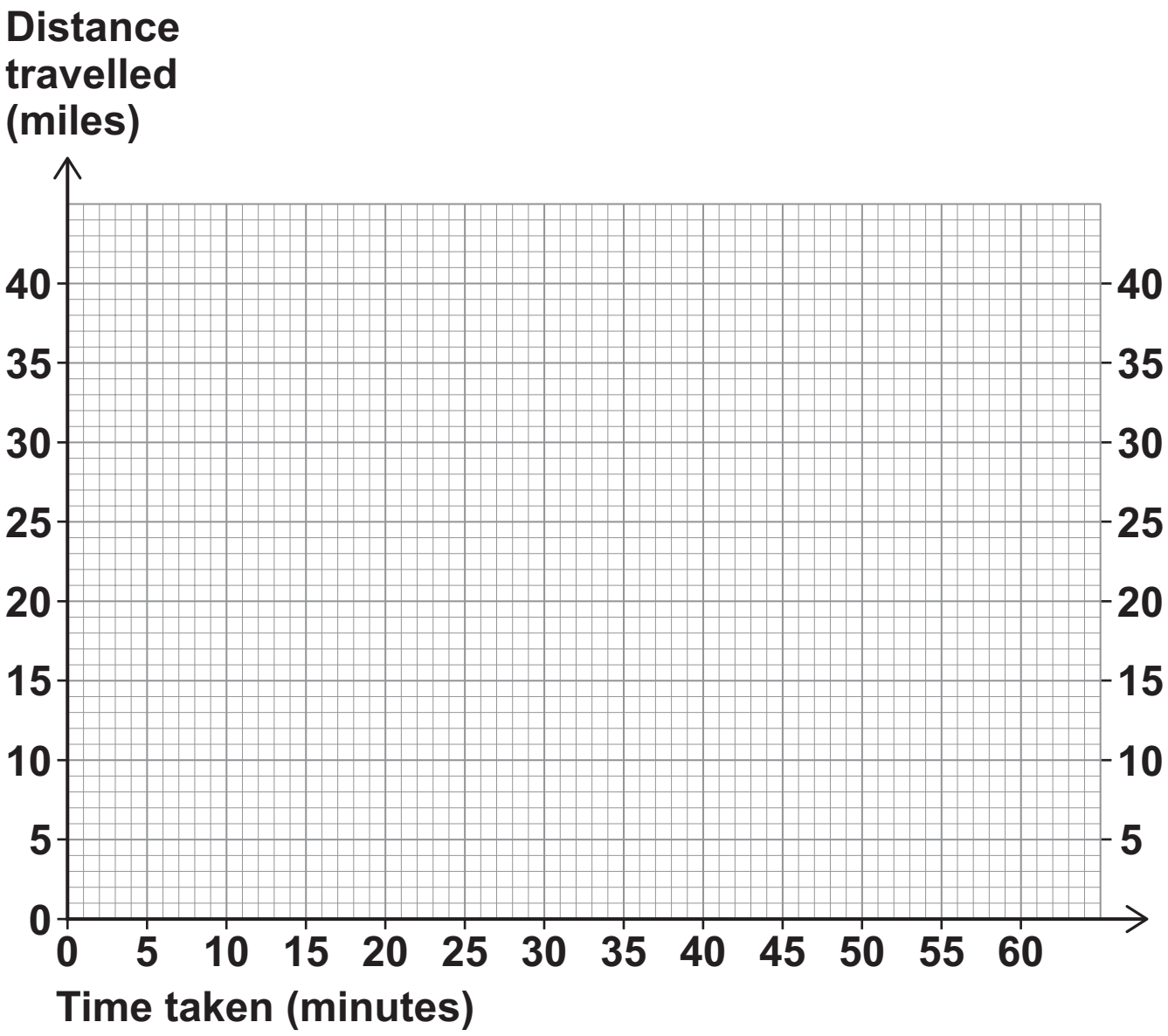
For the first 30 minutes her average speed is 40 miles per hour.

She then stops for 15 minutes.

She then completes the journey at an average speed of 60 miles per hour.

The total journey time is 1 hour.

8 (a) Draw a distance-time graph for her journey. [3 marks]



8 (b) Write down the average speed for the total journey. [1 mark]

_____

Answer _____mph

6

9 The table shows information about some CDs.

Type	Rock	Pop	Jazz
Number of CDs	2	x	$2x + 5$

A CD is chosen at random.

The probability it is ROCK is $\frac{1}{20}$

Work out the probability it is jazz. [4 marks]

_____

_____

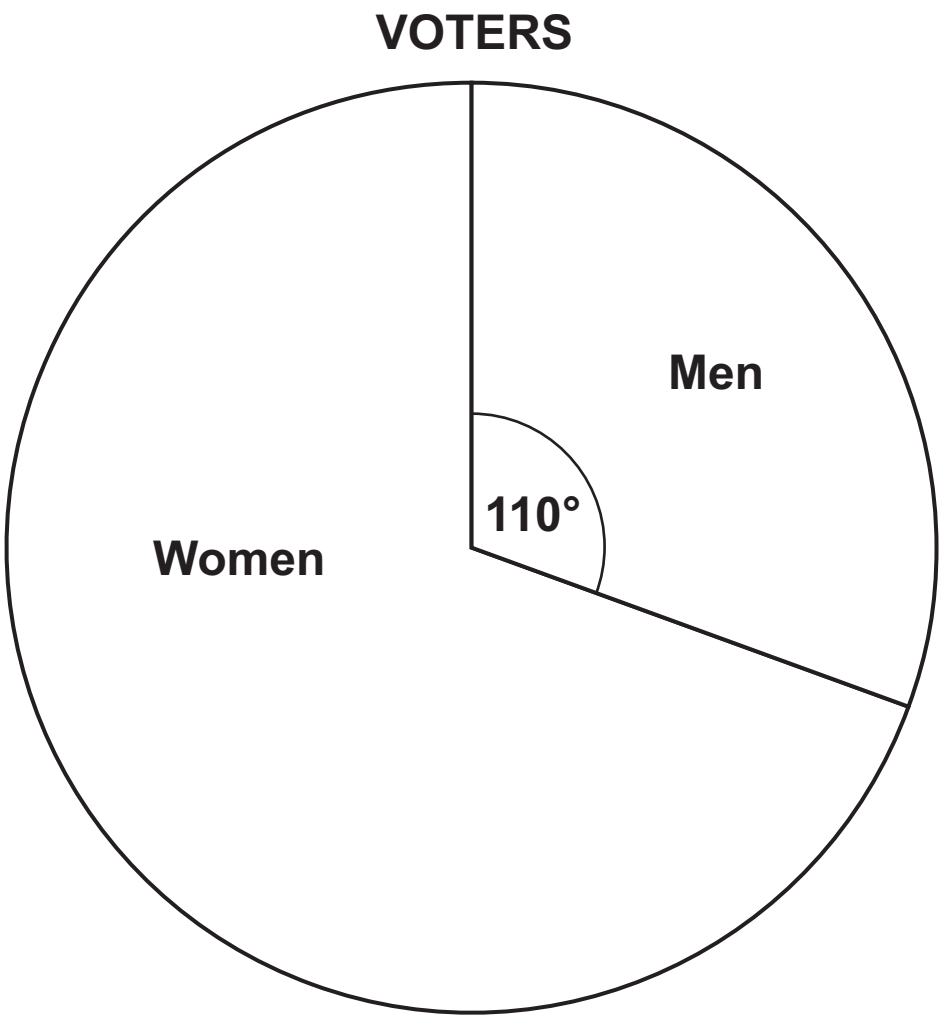
_____

_____

_____

Answer _____

10 **The pie chart shows information about voters in an election.**



3360 MORE women voted than men.

Work out the total number of voters. [3 marks]

Answer _____

7

11 **Write these numbers in DESCENDING order.**

9563 **$9{\cdot}56 \times 10^3$** **$9{\cdot}56 \times 3^{10}$**

[2 marks]

_____

_____

_____

_____

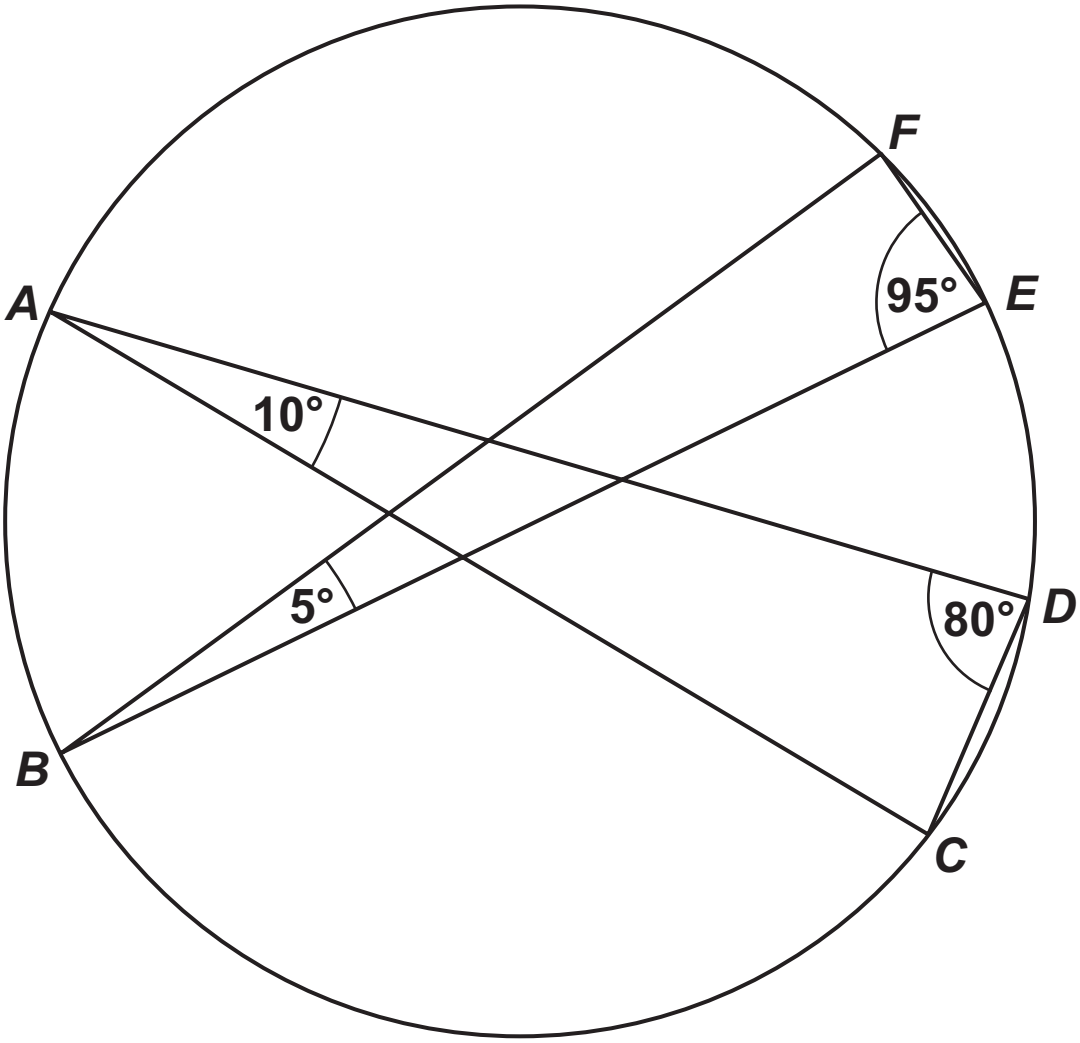
_____

Answer _____, _____, _____

[Turn over]

12 ***A*, *B*, *C*, *D*, *E* and *F* are points on a circle. Two triangles are formed in the circle, triangle *BFE* and triangle *ACD.***

Not drawn accurately



Circle the line that is a diameter of the circle.
[1 mark]

BE ***AD*** ***AC*** ***BF***

3

13 To make one cheese sandwich, Gina uses one bread roll and two cheese slices.

Pack of 15 bread rolls – £1·88
Pack of 20 cheese slices – £2·15

She is going to buy enough packs to

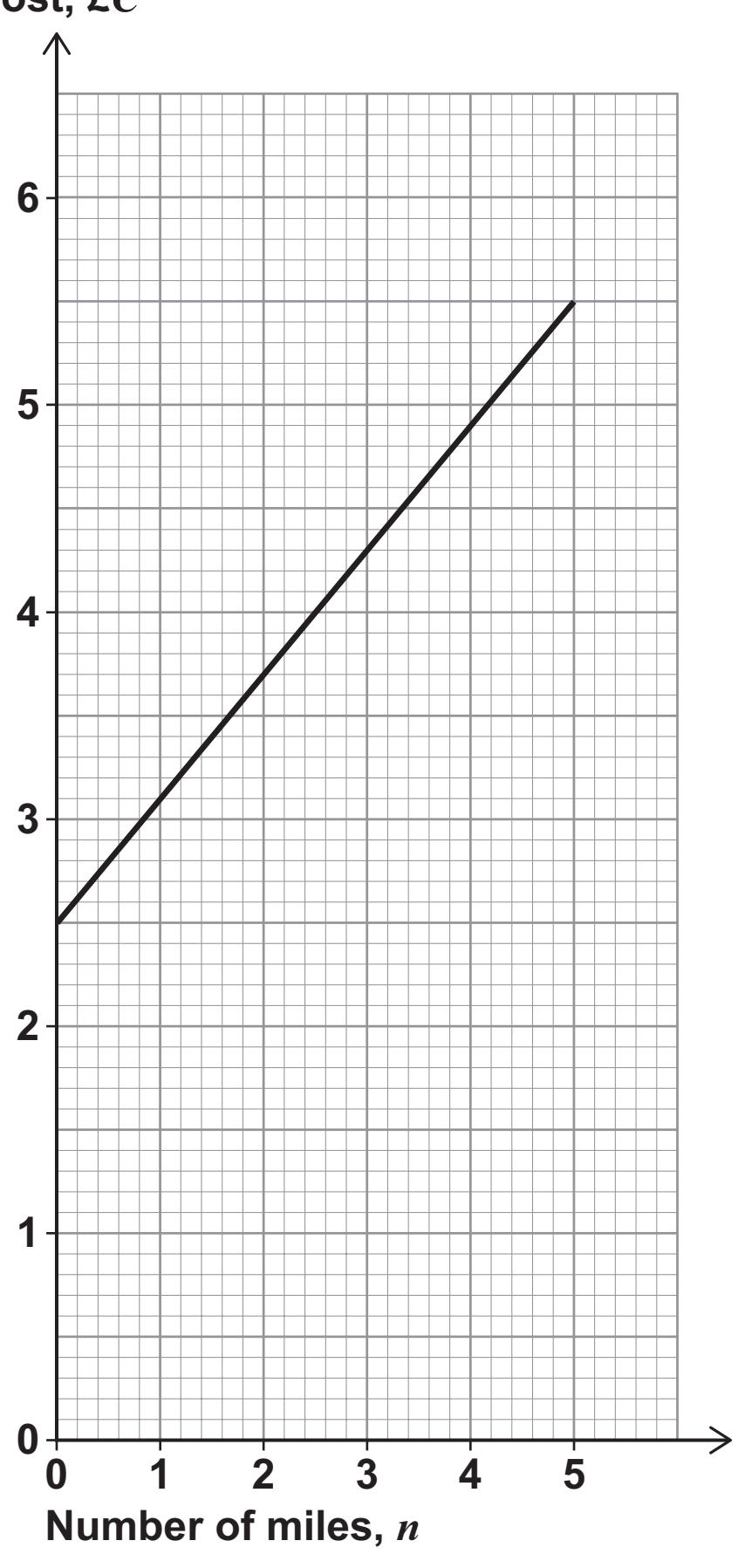
have exactly twice as many cheese slices as bread rolls

make MORE THAN 100 cheese sandwiches.

Work out the least amount she can spend.
[4 marks]

Answer £_____

14 The graph shows the cost of some taxi journeys.



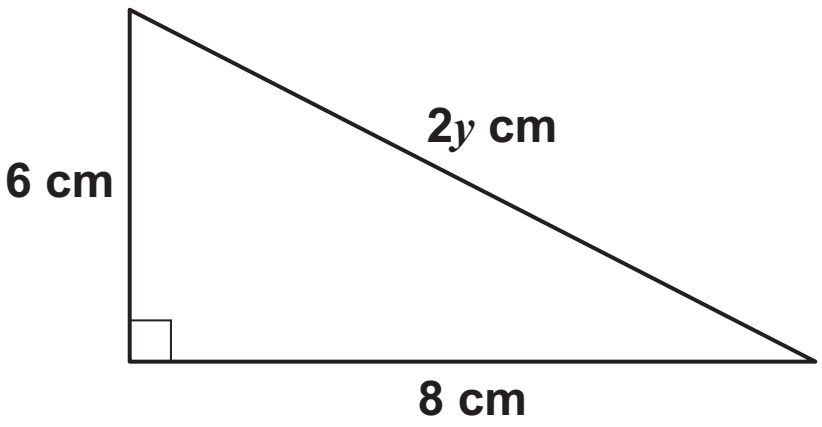
Work out a formula for C in terms of n.
[3 marks]

Answer _____

7

15 **Sami is trying to work out the exact value of y using Pythagoras' theorem.**

Not drawn accurately



Here is her working.

$$(2y)^2 = 6^2 + 8^2$$

$$2y^2 = 36 + 64$$

$$2y^2 = 100$$

$$y^2 = 100 \div 2$$

$$y^2 = 50$$

$$y = \sqrt{50}$$

15 (a) What error has she made in her working?
[1 mark]

_____

_____

_____

[Turn over]

15 (b) **Kai works out that $y = 5$**

Mel says,

"y cannot be 5 because the hypotenuse should be the longest side and the other sides are longer than 5 cm"

Is Mel correct?

Tick a box.

Yes ☐ **No** ☐

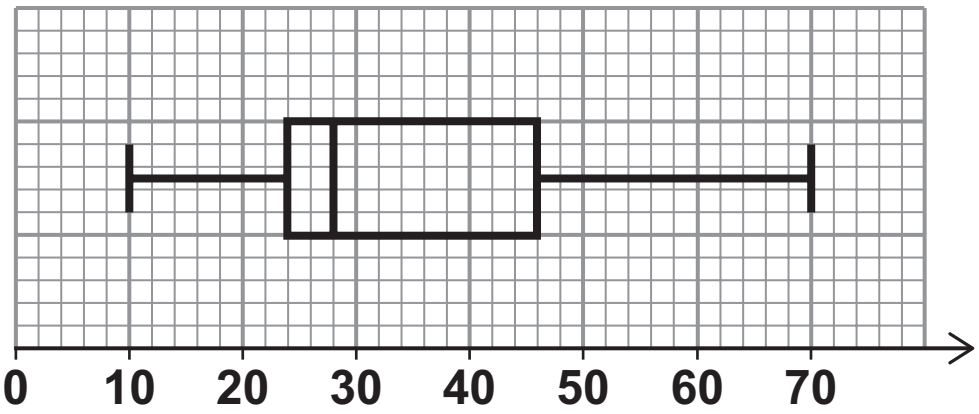
Give a reason for your answer. [1 mark]

_____

_____

_____

16 **Here is a box plot.**



Circle the median value. [1 mark]

28 **35** **24** **22**

3

17 P is a rectangle with length 50 cm and width x cm

Q is a rectangle with width y cm

Not drawn accurately

P

50 cm

x cm

Q

y cm

The length of Q is 20% MORE than the length of P.

The area of Q is 10% LESS than the area of P.

Work out the ratio $x : y$

Give your answer in its simplest form.
[4 marks]

Answer _____ : _____

[Turn over]

18 A school has 86 teachers.

42 are male and 44 are female.

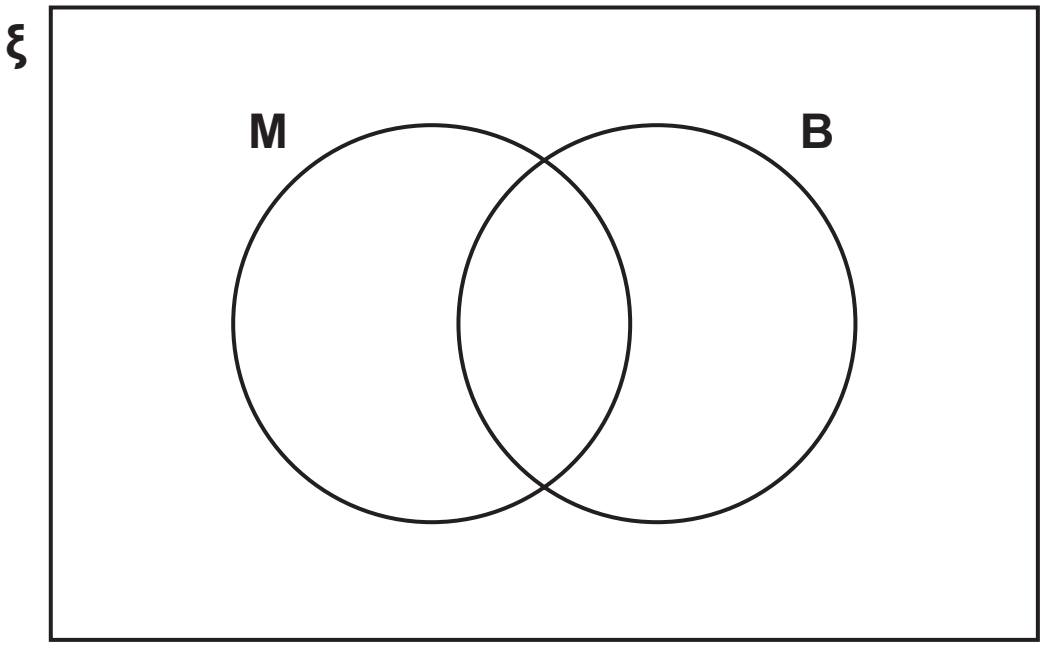
$\frac{1}{3}$ of the male teachers have blue eyes.

$\frac{1}{4}$ of the female teachers have blue eyes.

18 (a) ξ = teachers in the school

M = male teachers

B = teachers who have blue eyes



Complete the Venn diagram. [3 marks]

18 (b) One teacher who has blue eyes is chosen at random.

Work out the probability that the teacher is male. [1 mark]

Answer _____

8

[Turn over]

19 Rana sells 192 cakes in the ratio
small : medium : large = 7 : 6 : 11

The profit for one medium cake is twice the profit for one small cake.

The profit for one large cake is three times the profit for one small cake.

Her total profit is £532·48

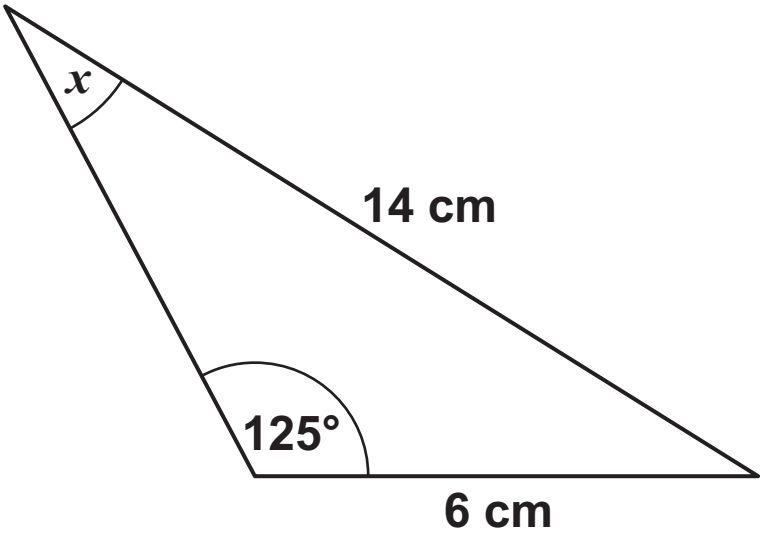
Work out the profit for one small cake.
[5 marks]

Answer £_____

[Turn over]

20 **Work out the size of angle x. [3 marks]**

Not drawn accurately



Answer _____ **degrees**

8

21 Solve $5x^2 = 10x + 4$

Give your answers to 2 decimal places.
[4 marks]

Answer _____

22 **A ball, dropped vertically, falls d metres in t seconds.**

d is directly proportional to the square of t.

The ball drops 45 metres in the first 3 seconds.

How far does the ball drop in the NEXT 7 seconds? [4 marks]

_____

_____

_____

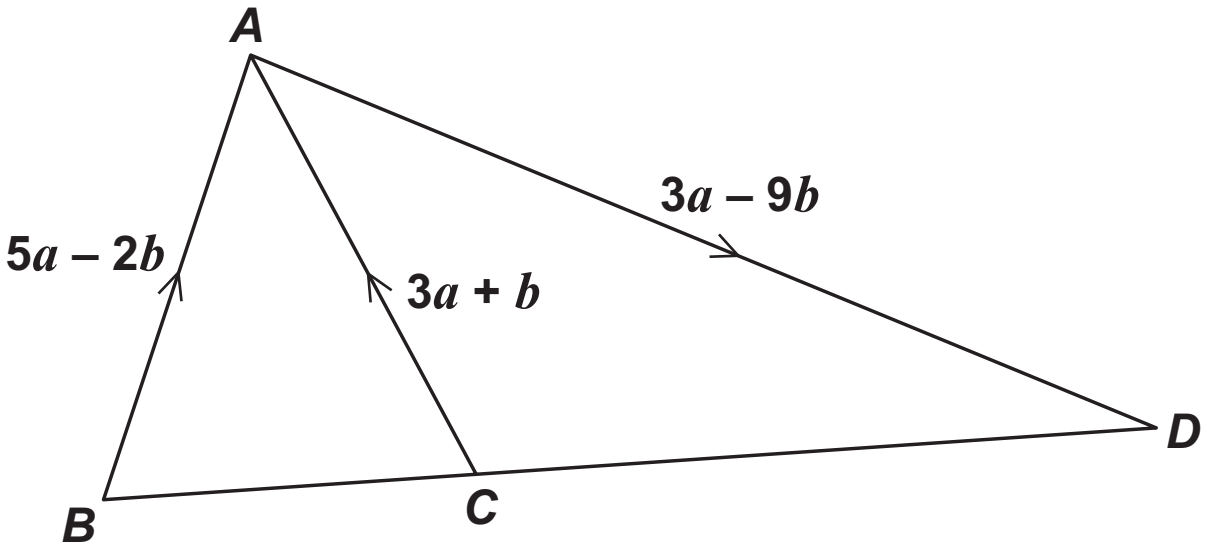
Answer _____ **metres**

8

[Turn over]

23

Not drawn accurately



Is *BCD* a straight line?

Show working to support your answer.
[3 marks]

_____

_____

_____

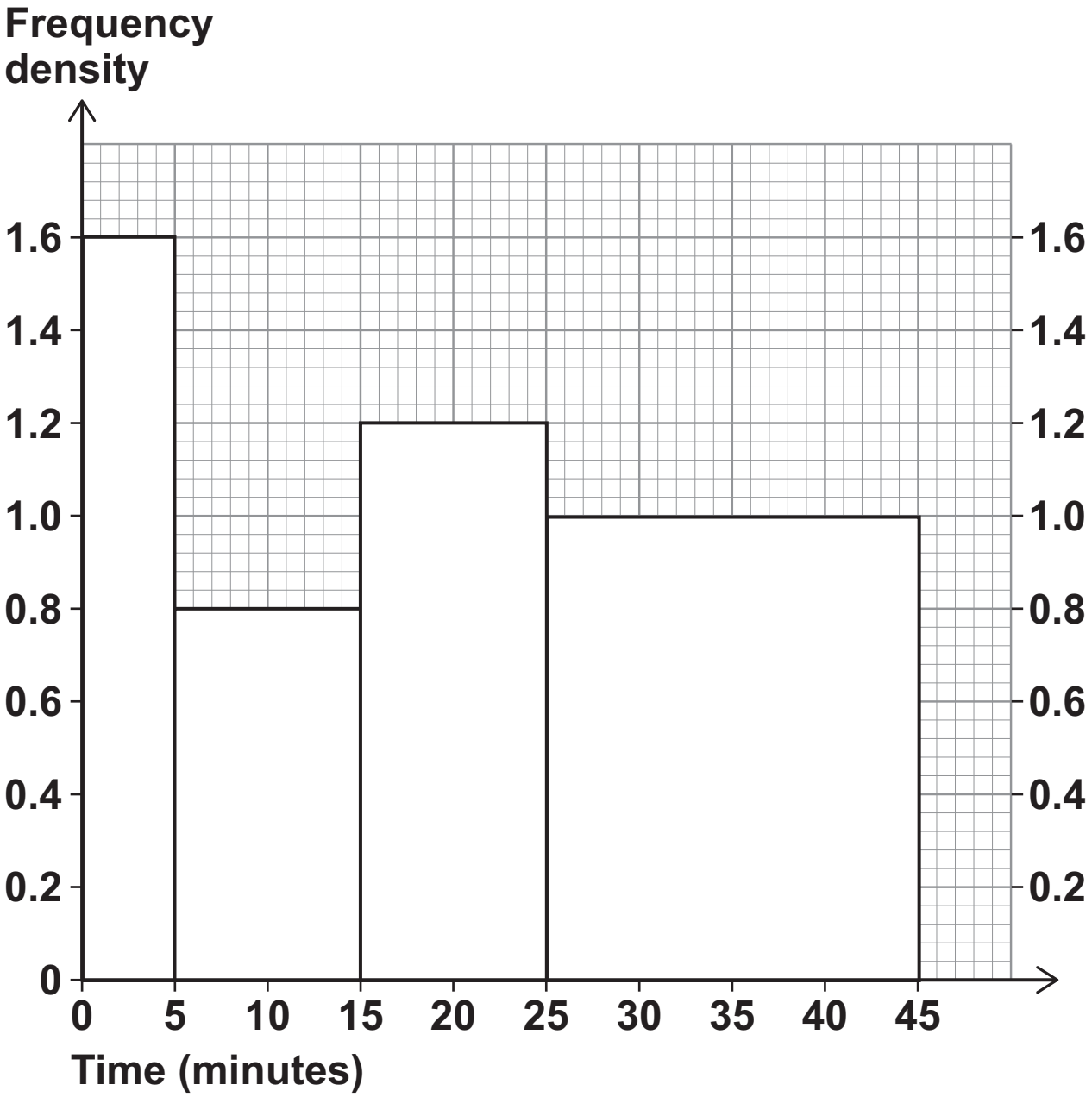
_____

Answer _____

[Turn over]

24 48 students completed some homework.

This histogram shows information about the times taken.



Work out an estimate of the interquartile range.

You MUST show your working. [4 marks]

Answer _____ minutes

7

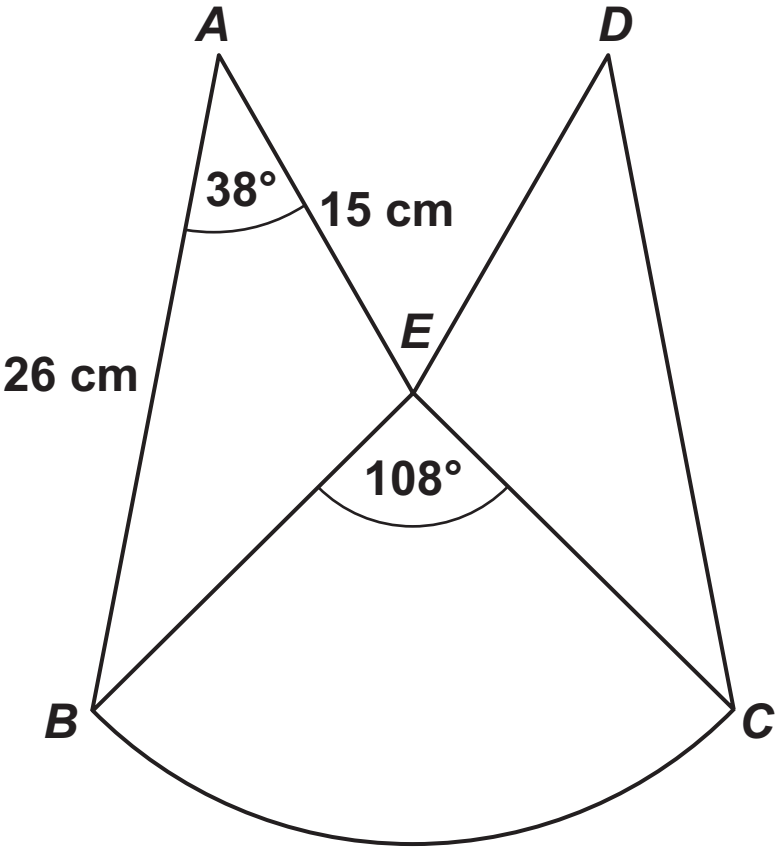
[Turn over]

25 The diagram shows a logo.

ABE and *DCE* are congruent triangles.

BCE is a sector of a circle, centre *E*.

Not drawn accurately

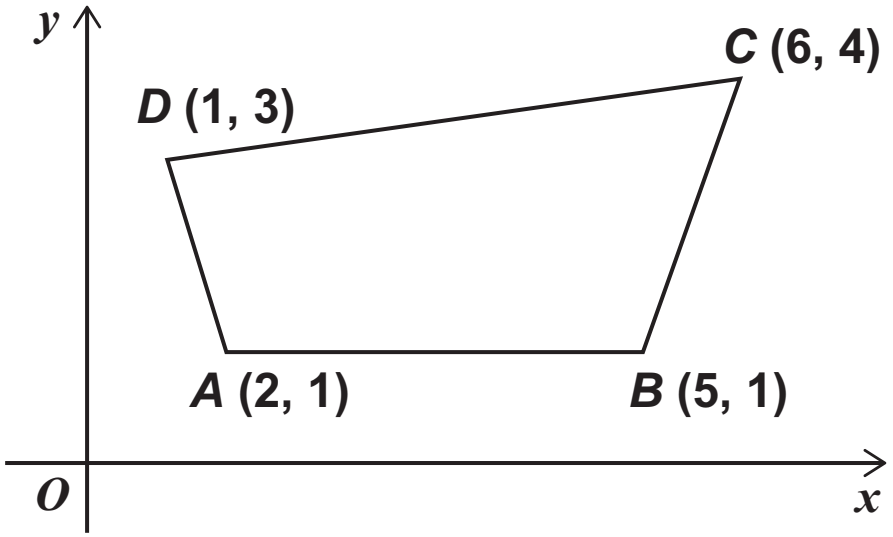


Show that the area of the logo is 510 cm^2 to 2 significant figures. [5 marks]

[Turn over]

26 (a) **A sketch of a quadrilateral *ABCD* is shown.**

Not drawn accurately



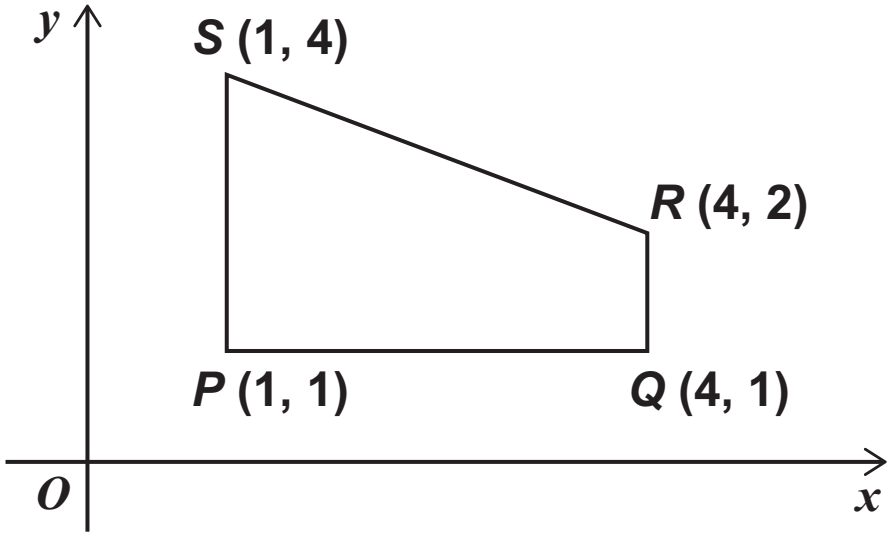
$ABCD$ is enlarged, centre B, scale factor $\frac{1}{3}$

Circle the vertex that is invariant. [1 mark]

A ***B*** ***C*** ***D***

26 (b) **A sketch of a quadrilateral *PQRS* is shown.**

Not drawn accurately



***PQRS* is reflected in the line $y = x$**

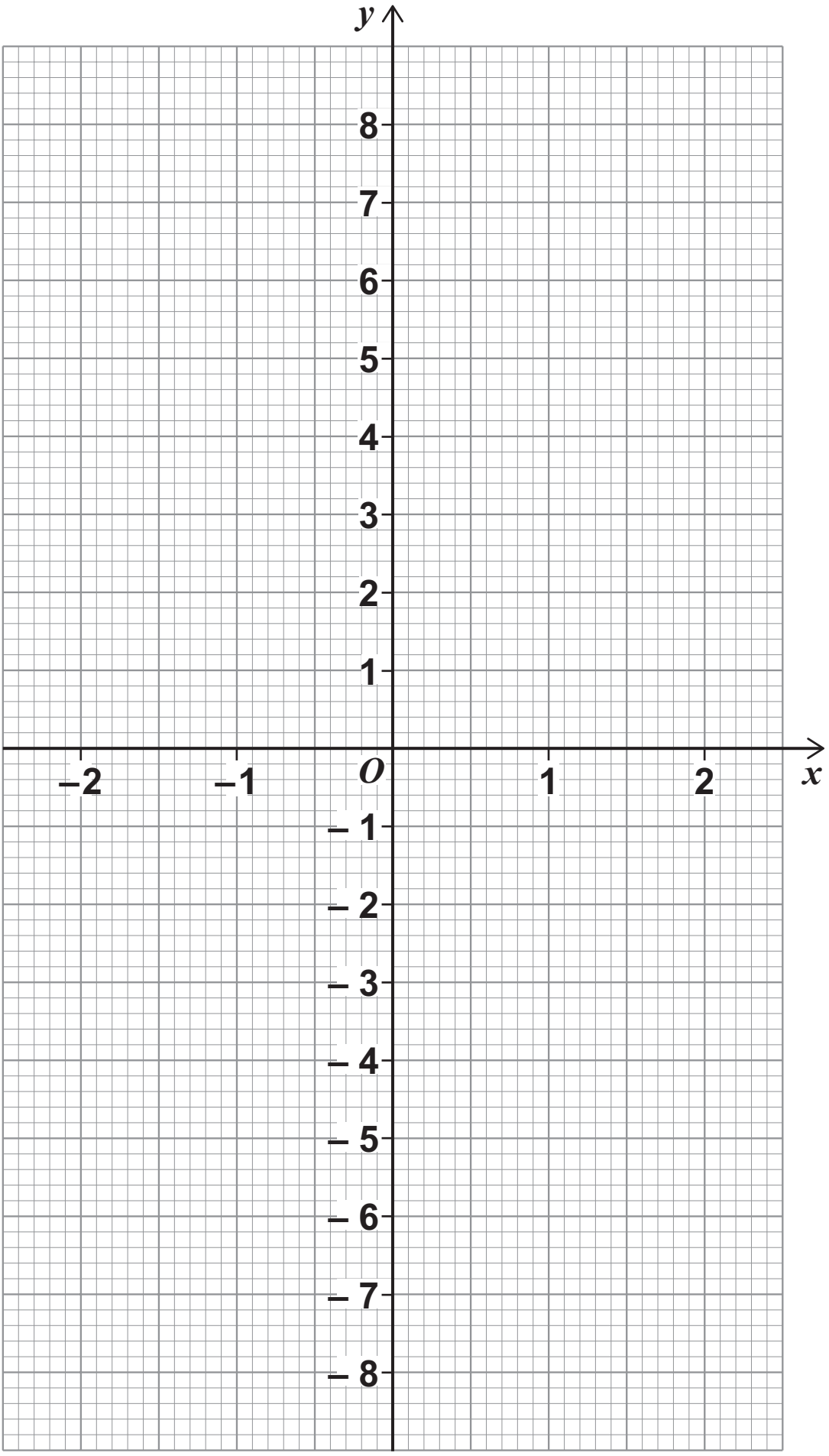
Circle the vertex that is invariant. [1 mark]

P ***Q*** ***R*** ***S***

7

27 (a) $h(x) = \sqrt[3]{x}$ **for all values of** x

On the grid opposite, draw the graph of the inverse function $y = h^{-1}(x)$ **for** $-2 \leqslant x \leqslant 2$
[2 marks]

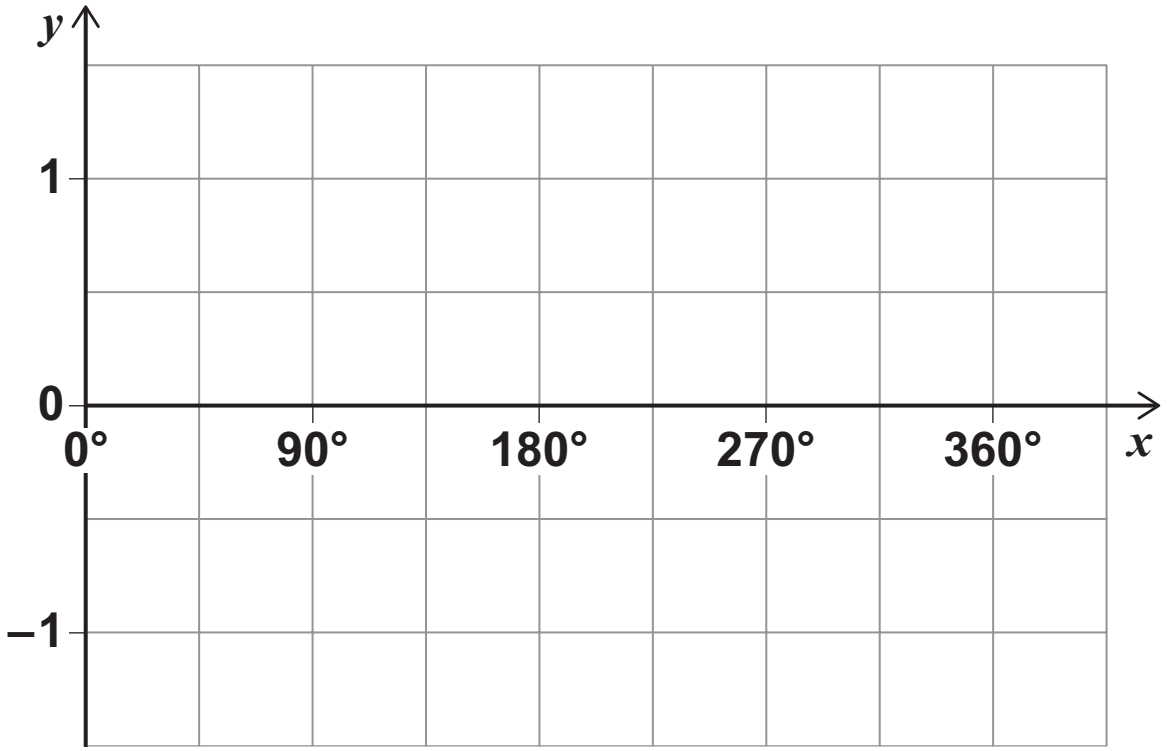

y
8
7
6
5
4
3
2
1
−2
−1
O
1
2
x
– 1
– 2
– 3
– 4
– 5
– 6
– 7
– 8

27 (b) For all values of x

$f(x) = \sin x$

$g(x) = x + 90$

On the grid opposite, draw the graph of the composite function $y = fg(x)$ for $0^o \leqslant x \leqslant 360^o$
[2 marks]



4

END OF QUESTIONS

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For Examiner's Use	
Pages	Mark
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34 – 37	
38 – 41	
42 – 45	
TOTAL	