



THIRD SPACE
LEARNING

Mathematics

Paper 2

(Calculator)

Higher Tier

AQA GCSE

SET 3

Mathematics Paper 2 (Non-Calculator) Higher Tier AQA

GCSE SET 3

Name

Total marks

Paper length: 1hr 30mins



Question	Mark
1	
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Instructions

- Use black ink or ball-point pen.
- Fill in the boxes at the top of this page with your name, centre number and candidate number.
- Answer all questions.
- Answer the questions in the spaces provided – there may be more space than you need.
- You must show all your working.
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- Calculators may be used.

Information

- The total mark for this paper is 80
- The marks for each question are shown in brackets – use this as a guide as to how much time to spend on each question.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

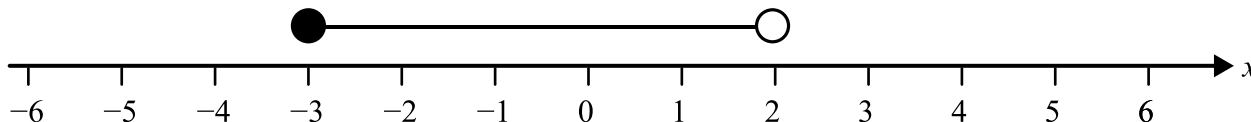
You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

This practice paper is based on the topics from the **advanced information for the November 2024 exam series**.

Please note, this practice paper is an example to help revision, these topics can be tested in other ways and other topics may be included in the actual papers

1 Write the inequality represented by the diagram.

[1 mark]



Answer _____

2 $8y = 5x$

Which statement is correct?

[1 mark]

y is 62.5% of x

y is 160% of x

x is 40% of y

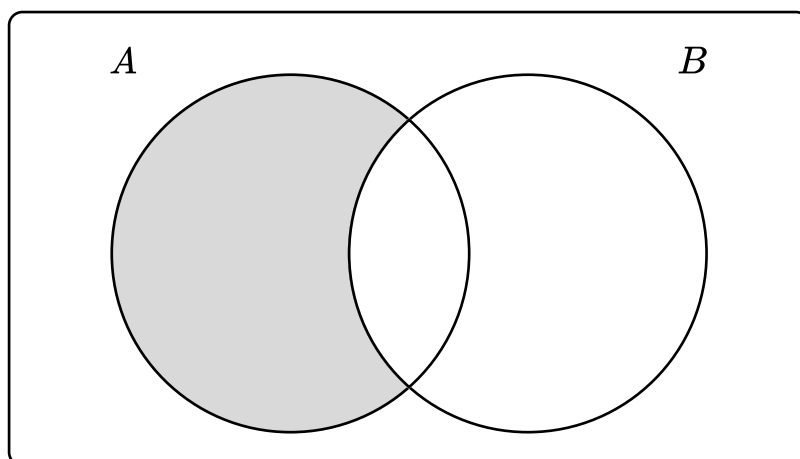
x is 85% of y

3 Write the fraction that is equal to 2.5% in the simplest form.

[1 mark]

Answer _____

4

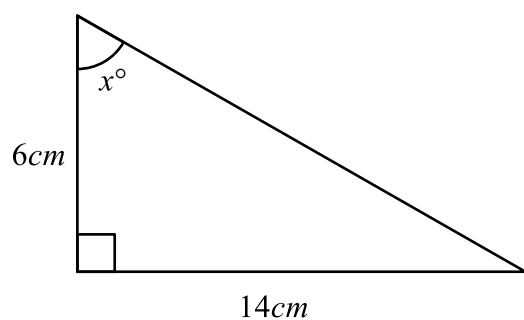


Write the set notation for the shaded region.

[1 mark]

Answer _____

5 Here is a right-angled triangle.



Work out the value of x .

Give your answer correct to 1 decimal place.

[3 marks]

Answer _____°

- 6 Hollie, Izzy and Jess all roll the same dice a number of times.
They each record how many times they roll a 6.

The table below shows their results.

	Hollie	Izzy	Jess
Number of rolls	20	50	200
Number of 6s	1	14	31

- (a) Whose results give the best estimate of the probability of rolling a 6 with this dice?
Explain your answer.

[1 mark]

because

- (b) Hollie says ‘I think the dice is biased’.
Do Hollie’s results support this statement? Explain your answer.

[1 mark]

because

- (c) Do the overall results support this statement? Explain your answer.

[1 mark]

because

7 A factory has 12 machines.

When all 12 machines are running, the factory produces 345600 bars of chocolate over an 8 hour operating window.

One day, 3 of the machines are broken.

For how long must the remaining machines work to ensure the same number of chocolate bars are made?

Give your answer in hours and minutes.

[3 marks]

Answer _____ hours _____ minutes

- 8 (a) Write the number 0.00238 in standard form.

[1 mark]

Answer _____

- (b) Work out $5.4 \times 10^4 - 3.7 \times 10^3$

Give your answer in standard form.

[2 marks]

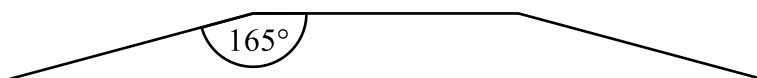
Answer _____

- (c) Write the ratio $3 \times 10^p : 4 \times 10^{p-1} : 5 \times 10^{p+1}$ in its simplest form.

[2 marks]

Answer _____

9 Here is a section of a regular polygon



Not drawn
accurately

(a) Work out the number of sides of the polygon.

[2 marks]

Answer _____

(b) Would this shape tessellate?

[1 mark]

Answer _____

10 $\mathbf{a} = \begin{pmatrix} x \\ 5 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 1 \\ y \end{pmatrix}$

(a) Find $3\mathbf{a} - 2\mathbf{b}$ as a column vector, in terms of x and y

[2 marks]

Answer $\begin{pmatrix} \quad \quad \end{pmatrix}$

(b) Given that $\mathbf{a} + \mathbf{b} = \begin{pmatrix} 4 \\ 3 \end{pmatrix}$,

$$\mathbf{a} + \mathbf{b} = \begin{pmatrix} 4 \\ 3 \end{pmatrix}$$

Find the values of x and y .

[2 marks]

$x =$ _____ $y =$ _____

11 Show that 925 can be written as
A square number multiplied by a prime number.

[2 marks]

12 Olivia invests £6000 in an account for one year.
At the end of the year, interest is added into her account.

Olivia pays tax on this interest at a rate of 20%.
She pays £54 in tax.

Work out the percentage interest rate for the account.

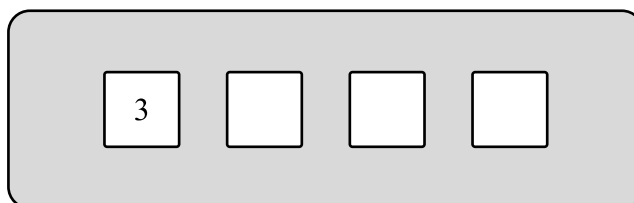
[4 marks]

Answer _____

- 13** Rebecca has a combination lock with 4 numbers.

Each dial contains the numbers 0 - 9 inclusive.

She is trying to remember the code.



She knows the first number is 3, the last number is even and that the second and third numbers are different.

How many possible different codes are there?

[3 marks]

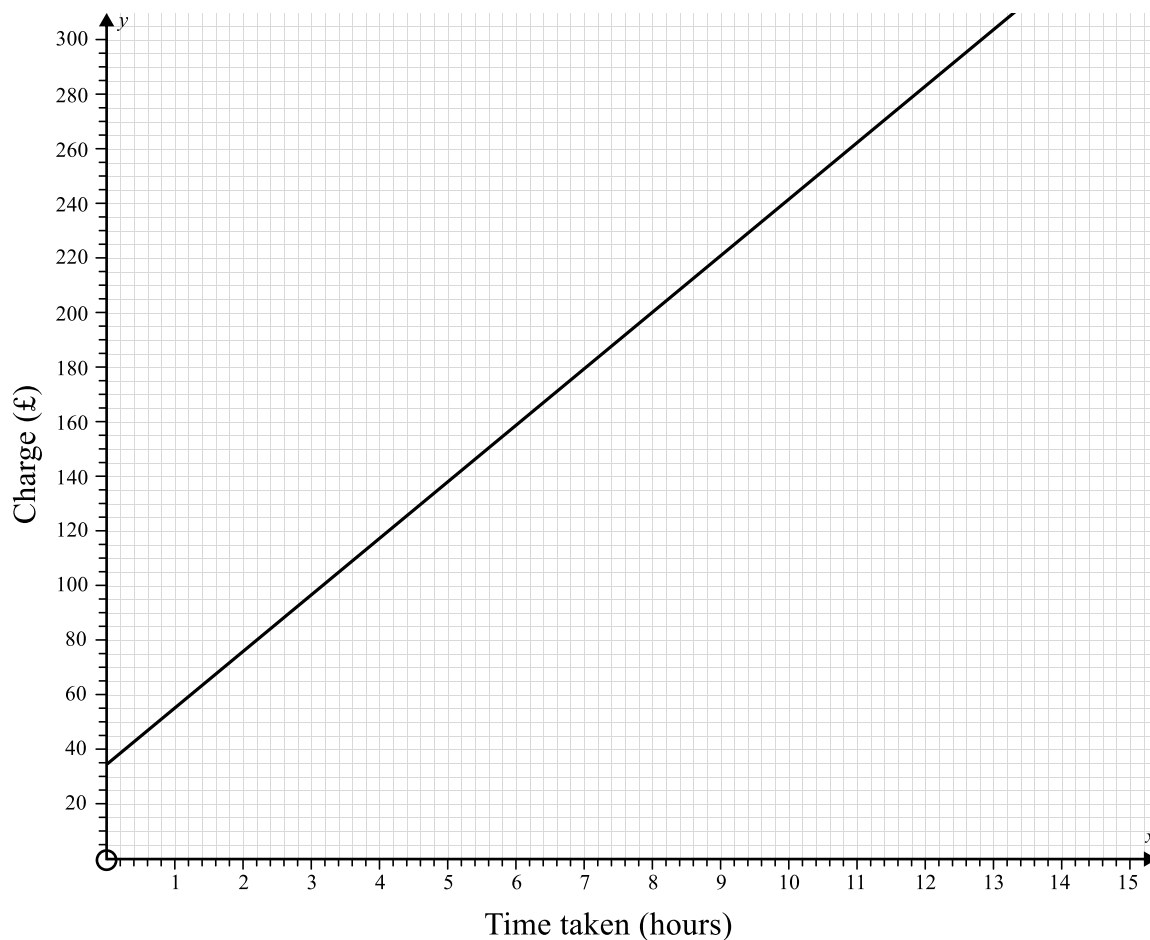
Answer _____

- 14** Rearrange $m = \sqrt{\frac{3p}{4}}$ to make p the subject.

[3 marks]

Answer _____

15 The graph gives information about the amount a builder charges per job.



(a) Find the gradient of the graph.

[2 marks]

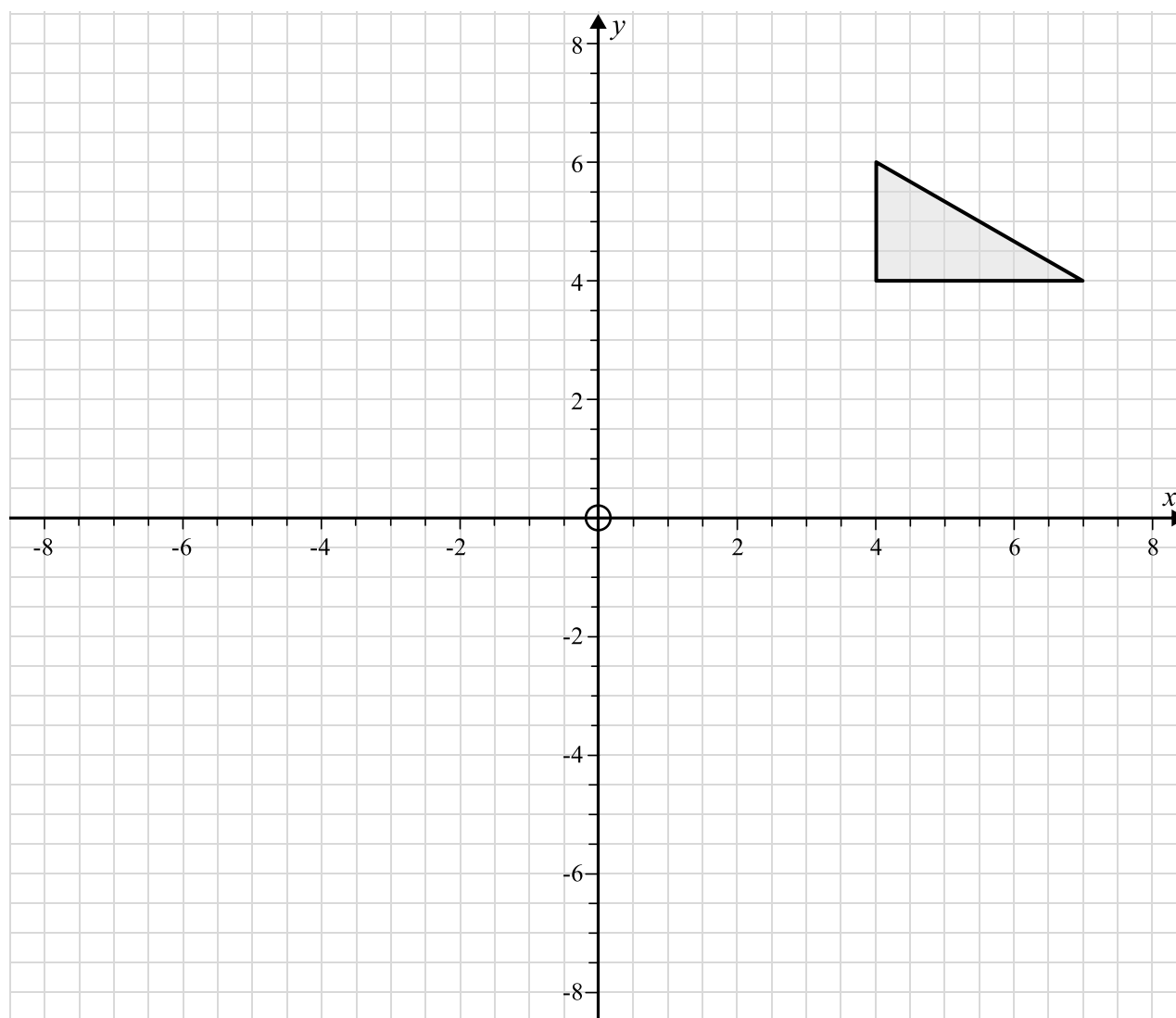
Answer _____

(b) Interpret what the gradient and the y intercept of the graph represent.

[2 marks]

Gradient:

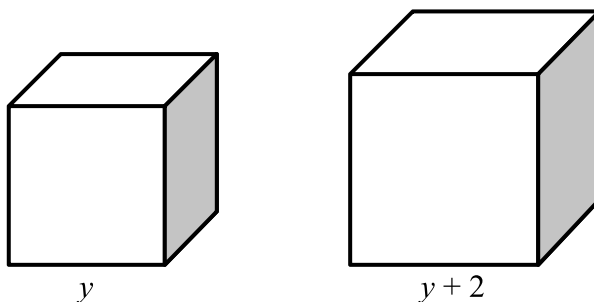
Y - intercept:

16**[3 marks]**

Enlarge the shaded shape by scale factor -2 with centre of enlargement $(3, 3)$

(Total for Question 13 is 3 marks)

- 17 Here are two cubes. The first cube has side length y and the second cube has side length $y + 2$.



The volume of the larger cube is 296cm^3 greater than the volume of the smaller cube.

- (a) Show that $y^2 + 2y - 48 = 0$

[3 marks]

- (b) Work out the volume of the smaller cube.

[3 marks]

Answer _____ cm^3

18 In a hotel room, the ratio of single rooms:twin rooms is 1:6.
The ratio of twin rooms:family rooms is 5:2.
There are 21 more family rooms than single rooms.
Work out the total number of rooms in the hotel.

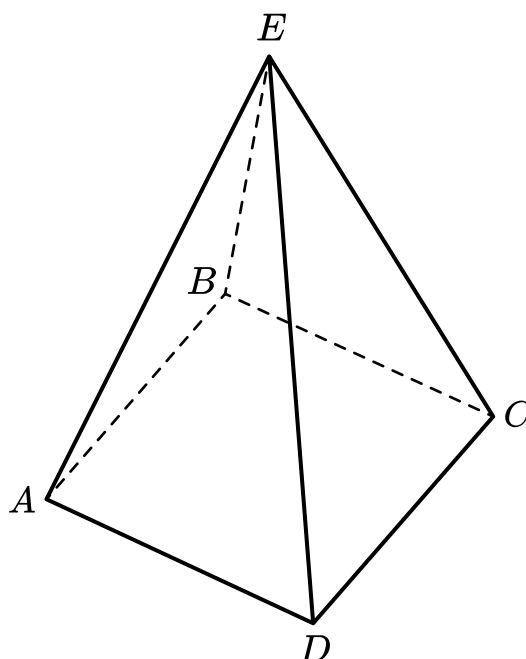
[3 marks]

Answer _____

19 Prove algebraically that the sum of the squares of any two consecutive odd numbers is always even.

[3 marks]

20 Here is a pyramid.



The base of the pyramid is a square, with an area of 36cm^2 .

The vertex E is 9cm vertically above the midpoint of AC .

Work out the exact surface area of the pyramid.

[4 marks]

Answer _____ cm^2

- 21 Show that $\frac{10x - 5}{4x + 3} \div \frac{8x^2 - 10x + 3}{16x^3 - 9x}$ can be simplified to ax where a is an integer.

[4 marks]

- 22 Two objects, A and B , are applying pressure to areas of the ground.

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

The force exerted by both objects is equal.

The area for object A is 40cm^2 and the pressure is $k \text{ newtons/m}^2$.

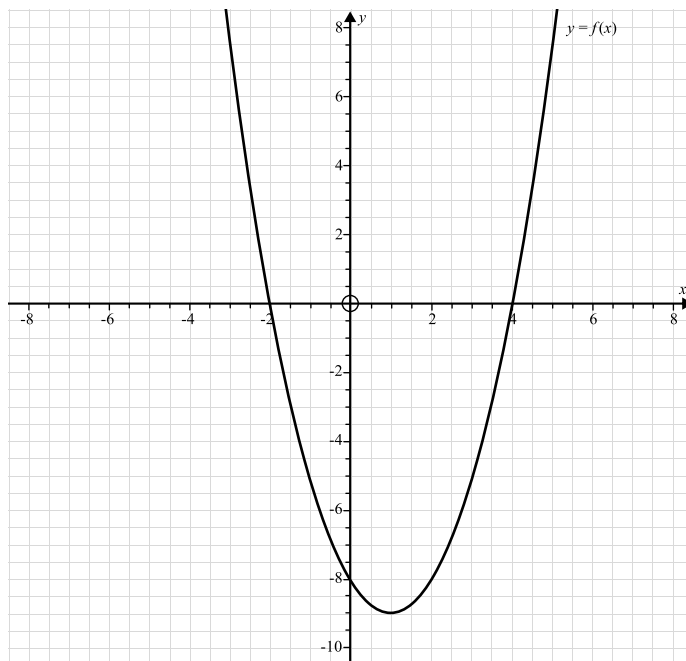
The area for object B is 80cm^2 .

Circle the pressure for object B .

[1 mark]

$$\frac{2}{k} \quad \frac{k}{2} \quad 2k \quad k + 40$$

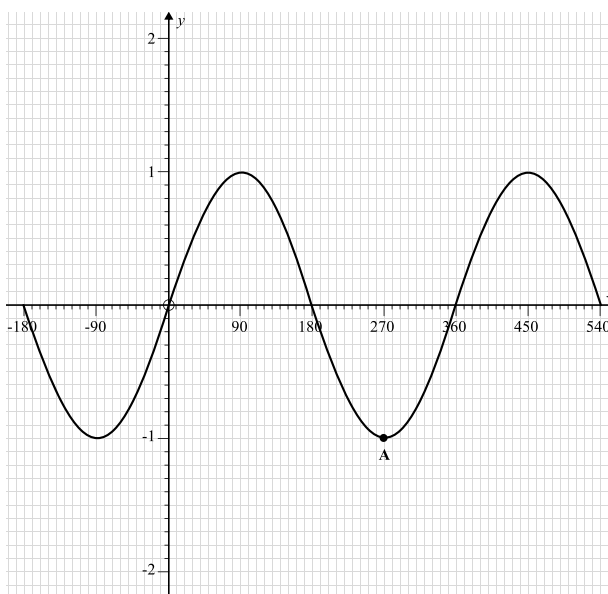
23 Shown is the graph of the curve with equation $y = f(x)$



(a) On the grid above, sketch the graph of the curve with equation $y = f(x + 2)$

[2 marks]

(b) Here is a sketch of the graph $y = \sin(x)$.



Point A lies on the graph of $y = \sin(x)$ and has coordinates $(270, -1)$.

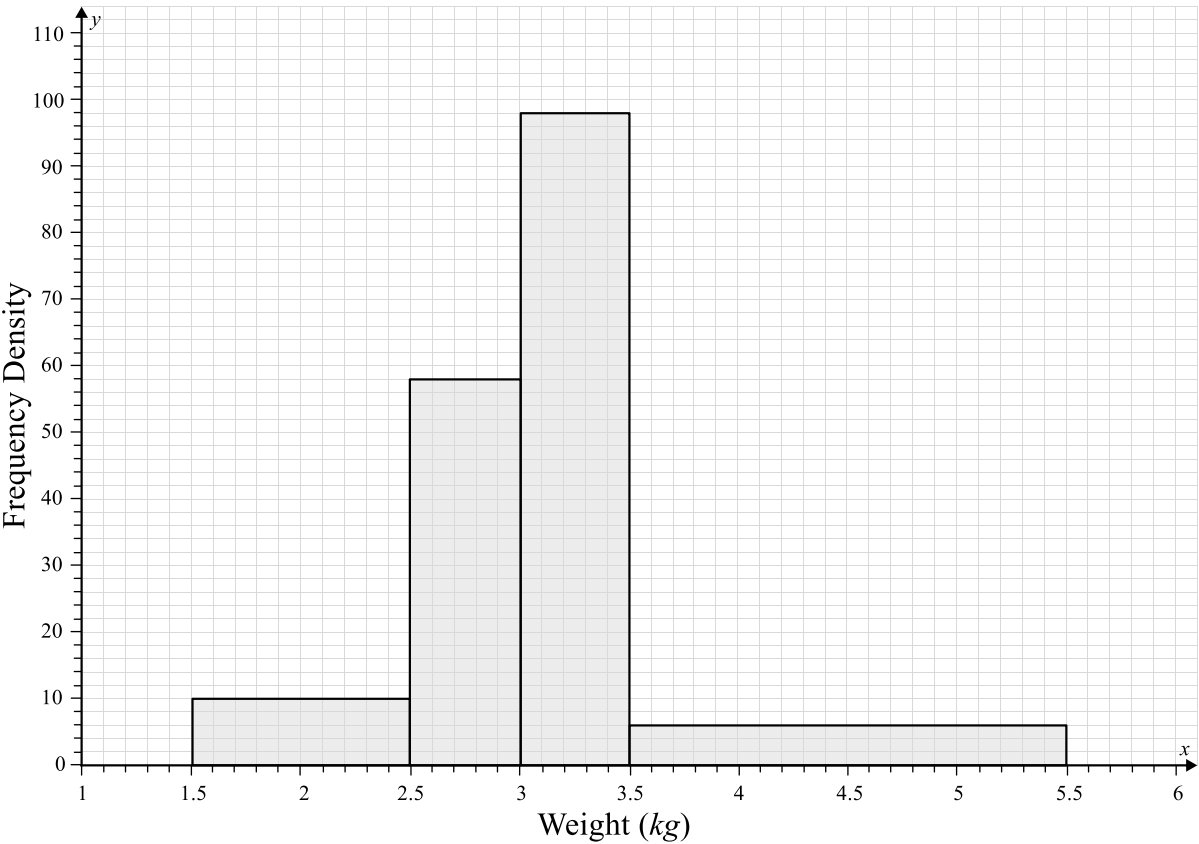
The graph is transformed and the equation of the resultant graph is $y = \sin(2x) + 1$

Write down the coordinates of point A after the transformations.

[2 marks]

Answer (_____ , _____)

24 The weight of 100 babies is recorded.
The results are shown on this histogram.

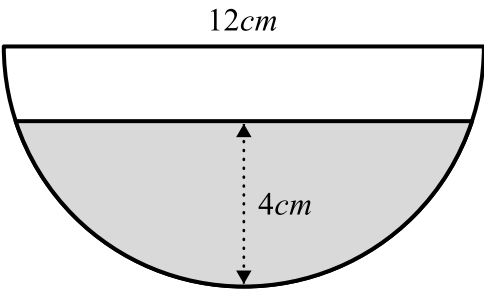


Use the histogram to estimate the mean weight of the babies.

[5 marks]

Answer _____

- 25** The cross-section of a container is a semi-circle with diameter 12cm .
The length of the container is 20cm .
The container is filled with water to a depth of 4cm .



Calculate the number of litres of water in the container.
Give your answer correct to 2 significant figures.

[6 marks]

Answer _____

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