GCSE MATHS EQUIVALENCY

Practice Exam Papers

Sample Paper - 2022/2023

Higher - Paper 1 – Non-calculator

Please write clearly in block capitals

Forename:	
Surname:	

Time Allowed: 60 minutes

50

Materials

For this paper you must have:
- mathematical instruments

You must ***not*** use a calculator.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or 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.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

Advice

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

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

Give your answer as an improper fraction in its simplest form.

[2 marks]

Answer _____

2 On a farm,

the number of cows and the number of sheep are in the ratio $4 : 7$

the number of sheep and the number of chickens are in the ratio $14 : 9$

There are 27 chickens on the farm.

How many cows are there on the farm?

[3 marks]

Answer _____

Turn over for next question

3 Ben is driving across Europe, the journey length is 4232 kilometres.

Ben's average speed is 68.3 km per hour.

He drives for 12 hours per day.

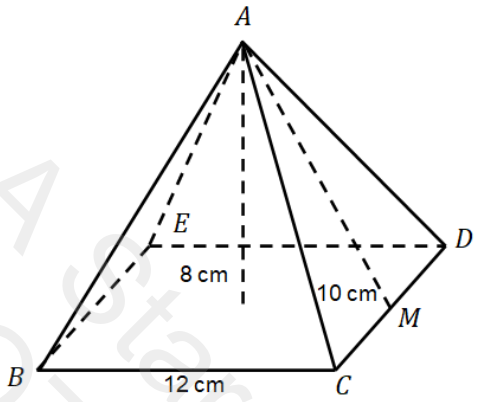
Estimate how many days it will take Ben to complete his journey.

[3 marks]

Answer _____

Turn over for next question

4 The diagram below shows a solid square-based pyramid $ABCDE$.



The base of the pyramid is a square of side 12 cm.

The height of the pyramid is 8 cm.

M is the midpoint of CD and $AM = 10$ cm.

Work out the total surface area of the pyramid.

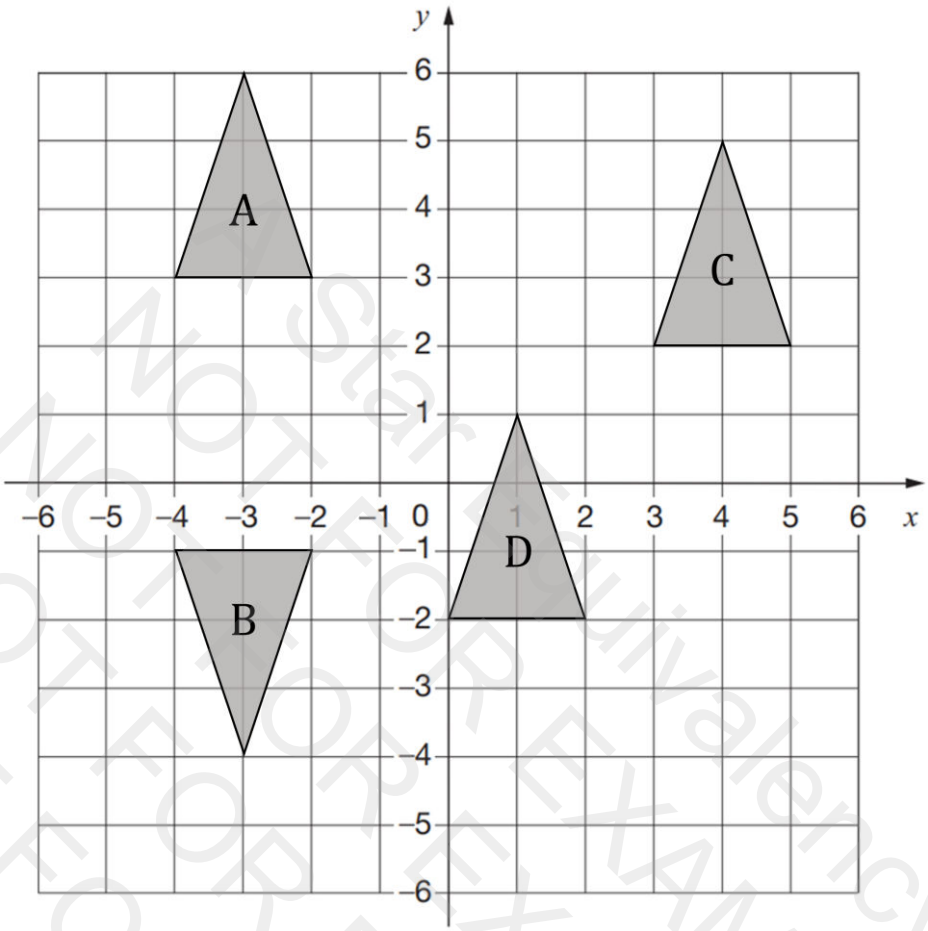
[4 marks]

Answer _____ cm^2

Turn over for next question

4

5



5(a) Describe the single transformation that maps shape A to shape B.

[1 mark]

5(b) Describe the single transformation that maps shape C to shape D.

[1 mark]

Turn over for next question

2

6 The perimeter of a right-angled triangle 160 cm.

The lengths of its sides are in the ratio $8 : 15 : 17$

Work out the area of the triangle.

[4 marks]

Answer _____ cm^2

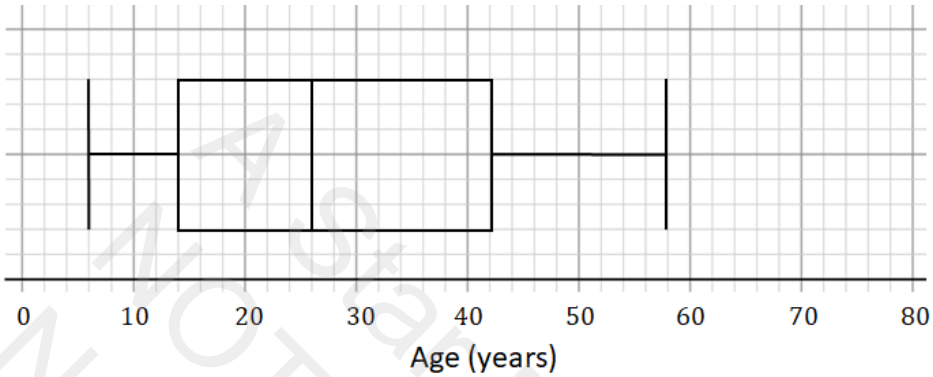
7 Write down the value of 64^0

[1 mark]

Answer _____

Turn over for next question

8 The box plot below represents information about the ages of people at Jack's birthday party.



8(a) Complete the table shown below.

Youngest	
Oldest	
Lower Quartile	
Upper Quartile	
Median	

[2 marks]

Turn over for next question

2

8(b) The table below shows some information about the ages of people who attended Laura's birthday party.

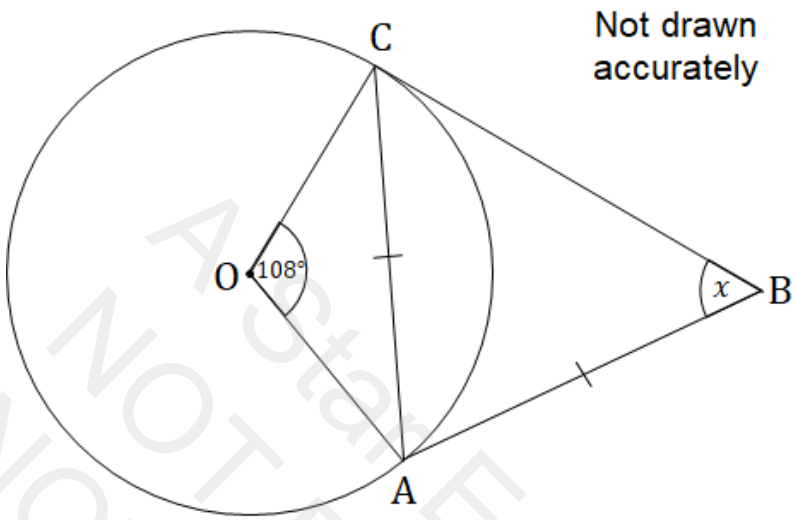
Youngest	11
Oldest	54
Lower Quartile	18
Upper Quartile	32
Median	29

Use your answer to part (a) and the information in this table to compare the distribution of ages of people at Jack's and Laura's birthday parties.

[3 marks]

Turn over for next question

9



A and C are points on a circle, centre O.

CB is a tangent to the circle.

Angle $AOC = 108°$

Find the size of angle x.

Give reasons for each stage of your working.

[5 marks]

Answer _____ °

Turn over for next question

5

10 $\sqrt{14}(\sqrt{50} - \sqrt{2})$ can be written in the form $a\sqrt{7}$ where a is an integer.

Find the value of a.

[3 marks]

$a =$ _____

11 p is inversely proportional to a^2

When $a = 4$, $p = 5.5$

a is directly proportional to q^2

When $q = 5$, $a = 100$

Find a formula for p in terms of q.

Give your answer in its simplest form.

[5 marks]

Answer _____

Turn over for next question

8

12 There are only red, blue and yellow crayons in a stationary box in a classroom.

The ratio of the number of blue crayons to the number of yellow crayons is $6 : 7$

Bethany takes at random a crayon from the stationary box.

The probability that crayon is red is 0.09

Work out the probability that Bethany takes a blue crayon from the stationary box.

[3 marks]

Answer _____

Turn over for next question

3

13 The point A has the coordinates $(8, 15)$

The point B has the coordinates (s, t)

A line perpendicular to AB is given by the equation $3y - 4x = 9$

Find an expression for t in terms of s.

[5 marks]

Answer _____

Turn over for next question

5

14 x is an integer such that

$5x - 4 > 11$ **and**

$$\frac{x^2}{9x - 14} < 1$$

Find all possible values of x.

[5 marks]

Answer _____

End of Questions

5

END

END

GCSE MATHS EQUIVALENCY

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Sample Paper – 2022/2023

Higher - Paper 2 – Calculator

Please write clearly in block capitals

Forename:	
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Materials

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Advice

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1(a) Simplify $g^2 \times g^5$

[1 mark]

Answer _____

1(b) Simplify $(3x^3y^4)^3$

[2 marks]

Answer _____

1(c) Simplify $\frac{36s^7t^3}{9s^5t}$

[2 marks]

Answer _____

Turn over for next question

5

2 Find the lowest common multiple (LCM) of 14 and 32.

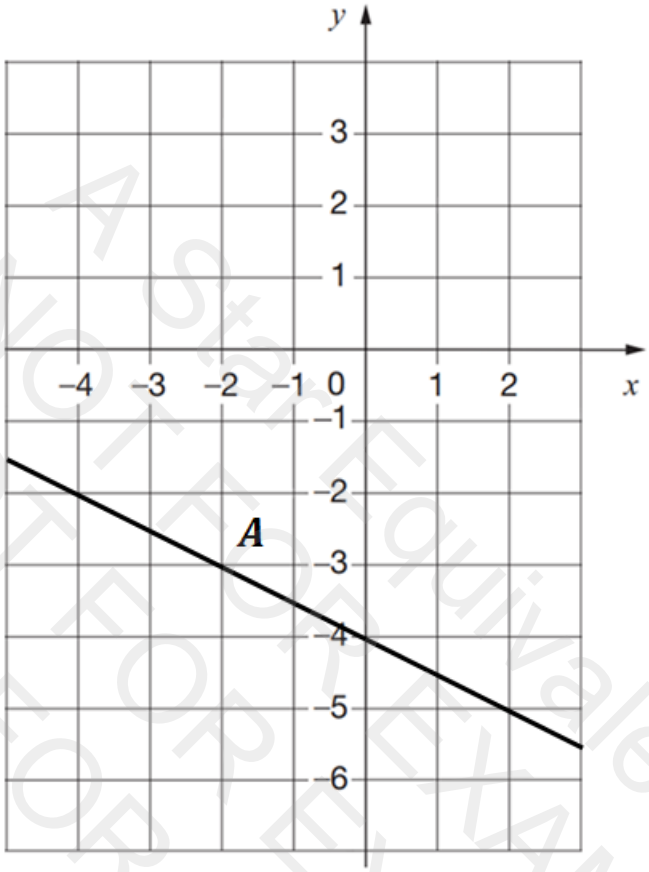
[2 marks]

Answer _____

Turn over for next question

2

3 The line A is shown on the grid.



Find an equation for the line A.

[3 marks]

Answer _____

Turn over for next question

3

4 Alex buys a new car worth £7000 and gets a discount of 10%.

Alex pays a deposit for the car.

She then pays the rest of the cost in 16 equal monthly payments of £306.25.

Find the ratio of the deposit Alex pays to the total of the 16 equal payments.

Give your answer in its simplest form.

[5 marks]

Answer _____

Turn over for next question

5

5 A force of $350\ \mathrm{N}$ acts on area of $20\ \mathrm{cm}^2$

The force is increased by $50\ \mathrm{N}$.

The area is increased by $5\ \mathrm{cm}^2$

Andy says, "The pressure has decreased by less than 10%"

Is Andy correct?

You must show how you get your answer.

Use the equation $\text{Pressure} = \frac{\text{Force}}{\text{Area}}$ to justify your answer.

[3 marks]

Answer _____

Turn over for next question

3

6 75 people were asked about whether they prefer walking, running or cycling.

33 of the people were female.

15 of the 21 people that said cycling were male.

10 females said walking.

32 people said running.

One of the males is chosen at random.

What is the probability that this male said running?

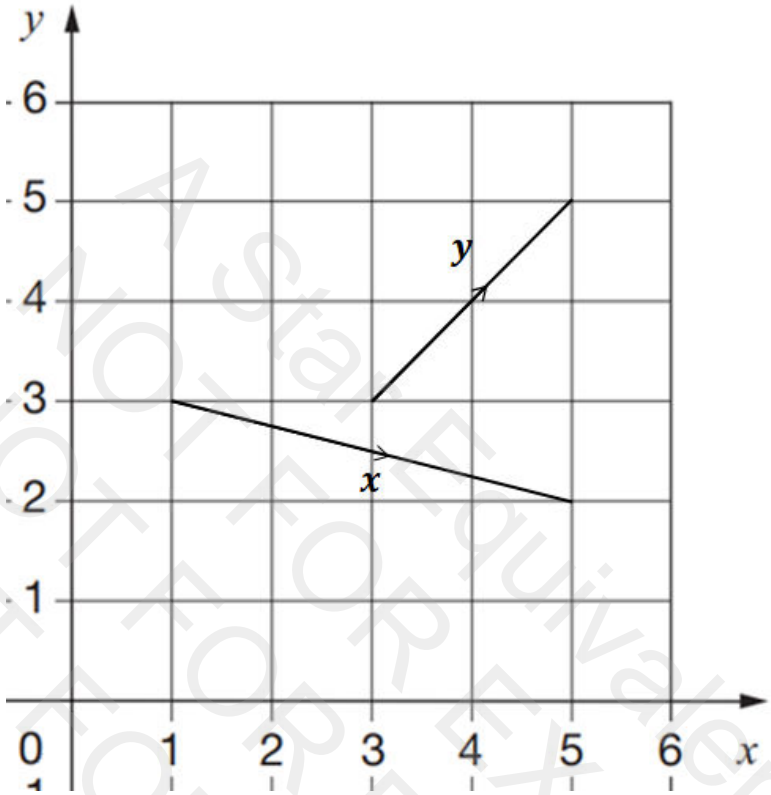
[4 marks]

Answer _____

Turn over for next question

4

7 The vector $\boldsymbol{x}$ and the vector $\boldsymbol{y}$ are shown on the grid.



Work out $2\boldsymbol{x} - 3\boldsymbol{y}$ as a column vector.

[3 marks]

Answer _____

Turn over for next question

3

8 f and g are functions such that,

$f(x) = \frac{5x^2}{3}$ and $g(x) = 4x^4$

8(a) Find $f(-3)$

[1 mark]

Answer _____

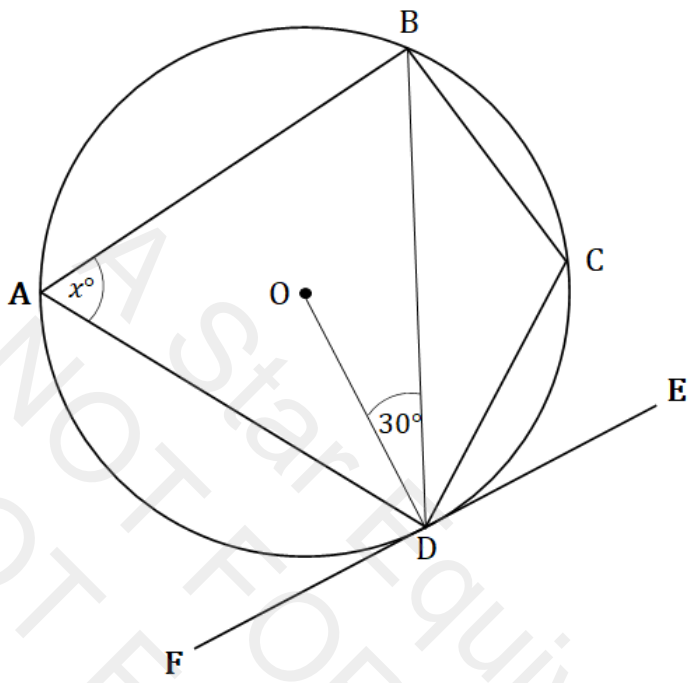
8(b) Find $fg(-1)$

[2 marks]

Answer _____

Turn over for next question

9



A, B, C and D are points on the circumference of a circle centre O.

FDE is a tangent to the circle.

Find the value of x.

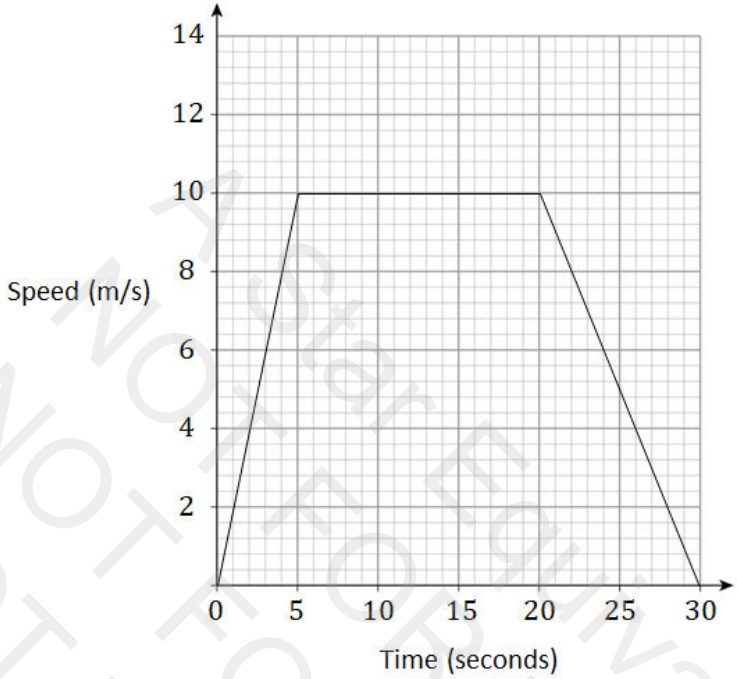
Give a reason for each stage of your working.

[3 marks]

Answer _____ °

Turn over for next question

10 The speed-time graph shows information about the start of a bike ride.



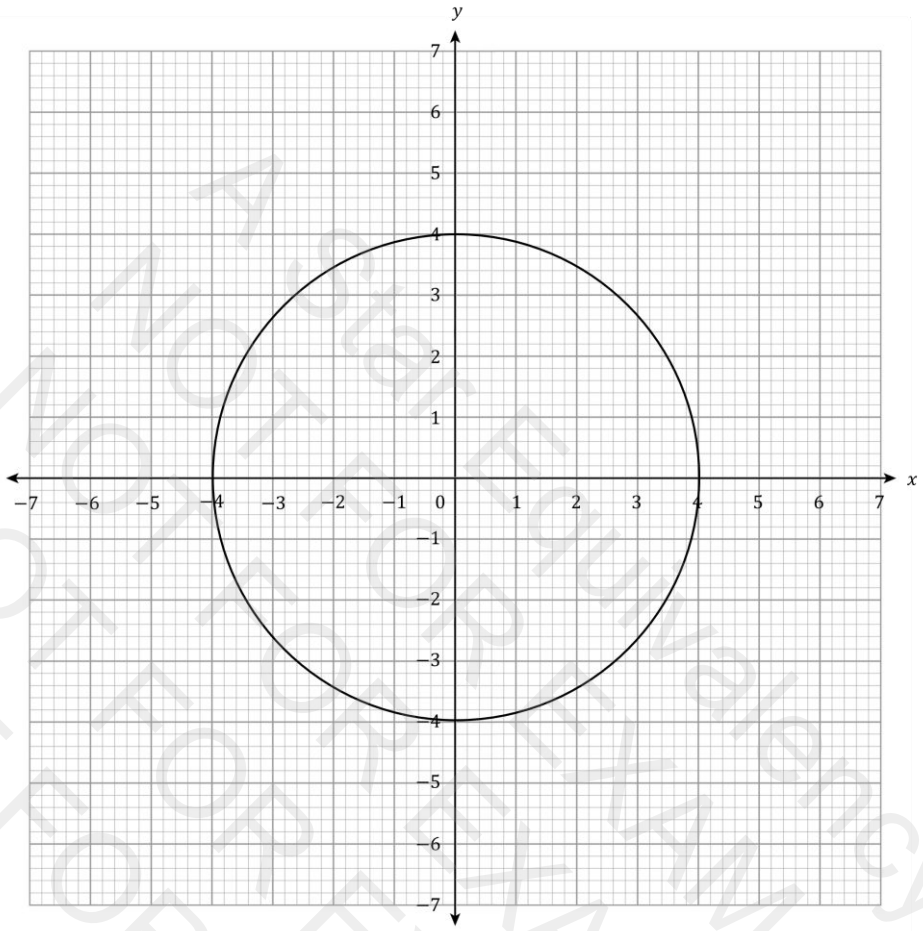
Use the graph to work out the distance travelled in the first 30 seconds of the bike ride.

[3 marks]

Answer _____ m

Turn over for next question

11 Below is a graph of a circle.



Write down the equation of the circle shown above.

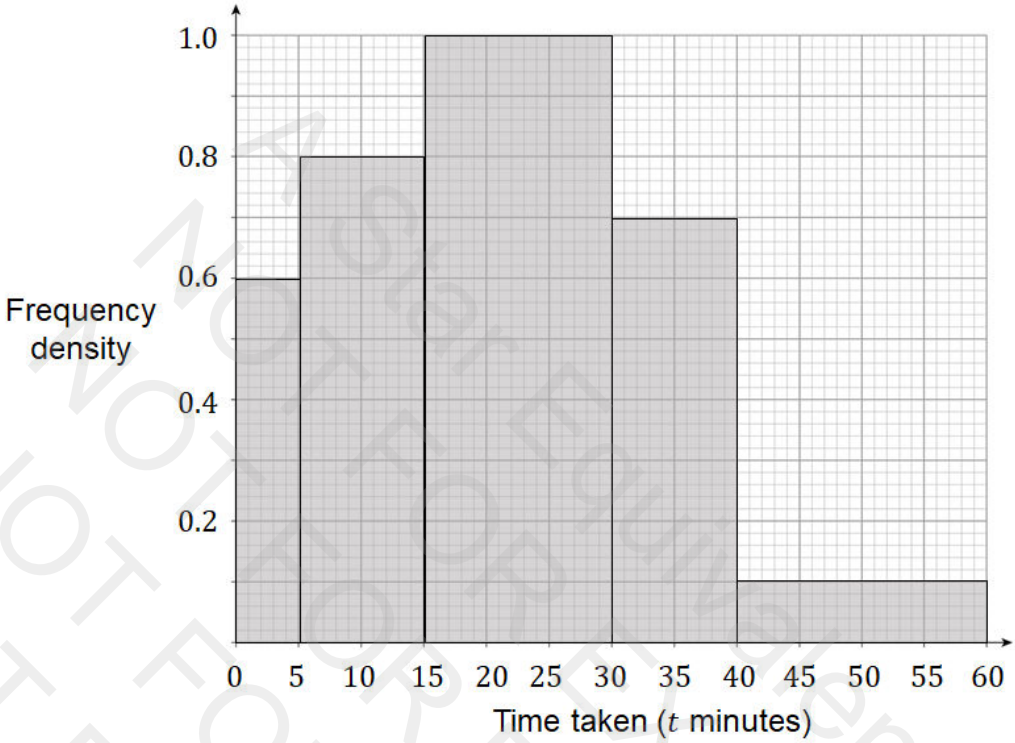
[2 marks]

Answer _____

Turn over for next question

2

12 The histogram shows information about the time it took for some tables to be served in a restaurant.



12(a) Complete the frequency table for this information.

Time taken (t minutes)	**Frequency**
$0 < t \leq 5$	3
$5 < t \leq 15$	
$15 < t \leq 30$	
$30 < t \leq 40$	
$40 < t \leq 60$	

[2 marks]

Question continues on the next page

2

12(b) Find an estimate for the upper quartile of the time taken to get served.

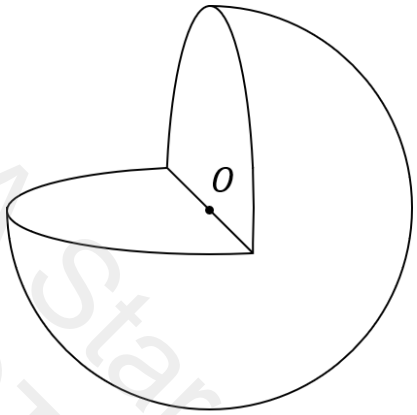
[2 marks]

Answer _____

Turn over for next question

2

13 Shape Q is three quarters of a solid sphere, centre O.



Shape **Q**

The volume of shape Q is $343\pi \text{ cm}^3$

Volume of a sphere $= \frac{4}{3}\pi r^3$

Surface area of a sphere $= 4\pi r^2$

Find the surface area of Q.

Give your answer correct to 3 significant figures.

[5 marks]

Answer _____ cm^2

Turn over for next question

5

14 Lenny is trying to find the density of a metal block.

The block is in the shape of a cuboid.

He measures,

the length of the block as $14.1\ \mathrm{cm}$ correct to the nearest mm,

the width of the block as $12.7\ \mathrm{cm}$ correct to the nearest mm,

the height of the block as $7.8\ \mathrm{cm}$ correct to the nearest mm,

He measures the mass as $10.7\ \mathrm{kg}$ correct to the nearest $100\ \mathrm{g}$.

By considering bounds, work out the minimum and maximum values for the density (in $\mathrm{g/cm^3}$) of the metal block.

Give your answers to three significant figures.

[5 marks]

Minimum = _____ $\mathrm{g/cm^3}$

Maximum = _____ $\mathrm{g/cm^3}$

End of Questions

5

END

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