



GCSE

3300U60–1

WEDNESDAY, 13 NOVEMBER 2024 – MORNING

**MATHEMATICS
UNIT 2: CALCULATOR – ALLOWED
HIGHER TIER**

**1 hour 45 minutes plus your additional
time allowance**

**A CALCULATOR WILL BE REQUIRED
FOR THIS EXAMINATION**

Surname: _____

First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

For Examiner's use only

Question	Maximum Mark	Mark Awarded
1.	7	
2.	4	
3.	3	
4.	3	
5.	6	
6.	4	
7.	5	
8.	5	
9.	4	
10.	2	
11.	3	
12.	3	
13.	2	
14.	4	
15.	4	
16.	3	
17.	1	
18.	4	
19.	5	
20.	8	
Total	80	

ADDITIONAL MATERIALS

A ruler, a protractor and a pair of compasses may be required.

ITEMS INCLUDED WITH QUESTION PAPER

A separate Formula List.

A separate Diagram Booklet.

Model for Question 8 and Question 12.

The Diagram Booklet MUST be handed in to the invigilators and sent for marking.

(Turn over)

INSTRUCTIONS TO CANDIDATES

Use black ink, black ball – point pen, black felt tip or your usual method.

Write your name, centre number and candidate number in the spaces on the front cover.

Answer ALL questions.

Write your answers in the spaces provided. If you run out of space, use the additional page(s) at the back of this booklet, taking care to number the question(s) correctly.

Take π as $3 \cdot 14$ or use the π button on your calculator.

(Turn over)

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part – question.

In question 1, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

(Turn over)

- 1. IN THIS QUESTION, YOU WILL BE ASSESSED ON THE QUALITY OF YOUR ORGANISATION, COMMUNICATION AND ACCURACY IN WRITING.**

A money box contains some 20p coins and some 50p coins.

The value of the 20p coins is £19.20

The ratio of the number of 20p coins to the number of 50p coins is 8 : 5

Find the total value of the coins in the money box.

You must show all your working.

3. Find five numbers so that:

- **their mean is $4 \cdot 5$**
- **their mode is $3 \cdot 5$**

Write your five numbers in the boxes on the next page.

(Turn over)

4. The interior angle of a regular polygon is 171°

How many sides does the polygon have?

(Turn over)

14

[3 marks]

(Turn over)

5. (a) Look at the diagram for Question 5 (a) in the separate Diagram Booklet. The diagram is NOT drawn to scale. The diagram shows a triangle labelled ABC .

In the diagram:

$$CB = 10.8 \text{ cm}$$

$$AB = 13.5 \text{ cm}$$

Angle ABC is a right angle.

Calculate the length of AC .

(Turn over)

[3 marks]

continued on the next page . . .

(Turn over)

Question 5 continued

- 5. (b) Look at the diagram for Question 5 (b) in the separate Diagram Booklet. The diagram is NOT drawn to scale. The diagram shows a triangle labelled PQR .**

In the diagram:

$$PQ = 19.8 \text{ cm}$$

$$PR = 8.7 \text{ cm}$$

Angle RPQ is a right angle.

$$\text{Angle } PRQ = x^\circ$$

Calculate the value of x .

(Turn over)

[3 marks]

(Turn over)

6. Look at the diagram for Question 6 in the separate Diagram Booklet. The diagram shows line AB .

Point C lies BELOW the line AB .

The region in which point C is located is such that:

- Angle $ABC \leq 30^\circ$
- line $BC \leq 6$ cm.

Use a ruler and a pair of compasses to **CONSTRUCT** suitable arcs and lines to show this region.

You must show your construction arcs.

Shade the region in which point C is located.

[4 marks]

(Turn over)

- 7. Look at the diagram for Question 7 in the separate Diagram Booklet. The diagram shows a graph. PowrUp is a company that makes batteries. The quality of the batteries is tested regularly. PowrUp calculates the relative frequency of faulty batteries after checking a total of 1000, 2000, 3000, 4000 and 5000 batteries. The results are plotted on the graph.**

continued on the next page . . .

Question 7 continued

- 7. (a) One battery is selected at random. Write down the best estimate for the probability that this battery will be faulty. You must give a reason for your choice.**

Probability = _____

Reason:

[2 marks]

continued on the next page . . .

(Turn over)

Question 7 continued

7. (b) It costs the company 2 • 6p to dispose of each of the faulty batteries.

How much will it cost the company to dispose of all the faulty batteries after testing the first 3000 batteries?

You must show all your working.

9. **2400 tickets were sold for a concert. The table below shows the cost of the different types of ticket.**

Ticket	Cost per ticket
SEATED	£45
STANDING	£23

The total cost of all the 2400 tickets sold was £89 520

Let x represent the number of seated tickets sold.

Let y represent the number of standing tickets sold.

continued on the next page . . .

(Turn over)

Question 9 continued

9. (a) Complete the following table.

	Equation in terms of x and y
Total number of tickets sold	$x + y = 2400$
Total cost of tickets sold	

[1 mark]

continued on the next page . . .

(Turn over)

The number of seated tickets sold,

$x =$ _____

The number of standing tickets sold,

$y =$ _____

[3 marks]

(Turn over)

10. Look at the diagram for Question 10 in the separate Diagram Booklet.

The diagram shows a triangle on a grid.

Enlarge the given triangle by a scale factor of -2 , using point A as the centre of enlargement.

[2 marks]

(Turn over)

[3 marks]

(Turn over)

35

[3 marks]

(Turn over)

13. Look at the diagram for Question 13 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

***FD* is the tangent to the circle at point *E*, as shown in the diagram.**

***ABCD* is a straight line.**

Angle *ABE* = 130°

Angle *BEC* = 60°

Calculate the size of angle *CDE*.

(Turn over)

[4 marks]

(Turn over)

[4 marks]

(Turn over)

***n*th term = _____**

250th term = _____

[3 marks]

(Turn over)

17. Circle the expression that is equivalent to $(m^{64})^{\frac{3}{2}}$

m^{16}	$m^{\frac{125}{2}}$	$m^{\frac{131}{2}}$	m^{96}	m^{512}
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[1 mark]

(Turn over)

18. A bag contains 3 red counters, 5 blue counters and 7 yellow counters.

Sali takes three counters at random from the bag. These counters are not replaced.

Calculate the probability that AT LEAST TWO of the counters are the same colour.

[4 marks]

(Turn over)

20. Look at the diagram for Question 20 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

In the shape shown,

$CD = 6$ cm, $CH = 7$ cm and

$GH = 5$ cm.

Angle $CGH = x$

GH is the radius of the circle with centre G .

CDG is a straight line.

(a) Calculate the size of angle x .

(Turn over)



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Diagram Booklet

Surname: _____

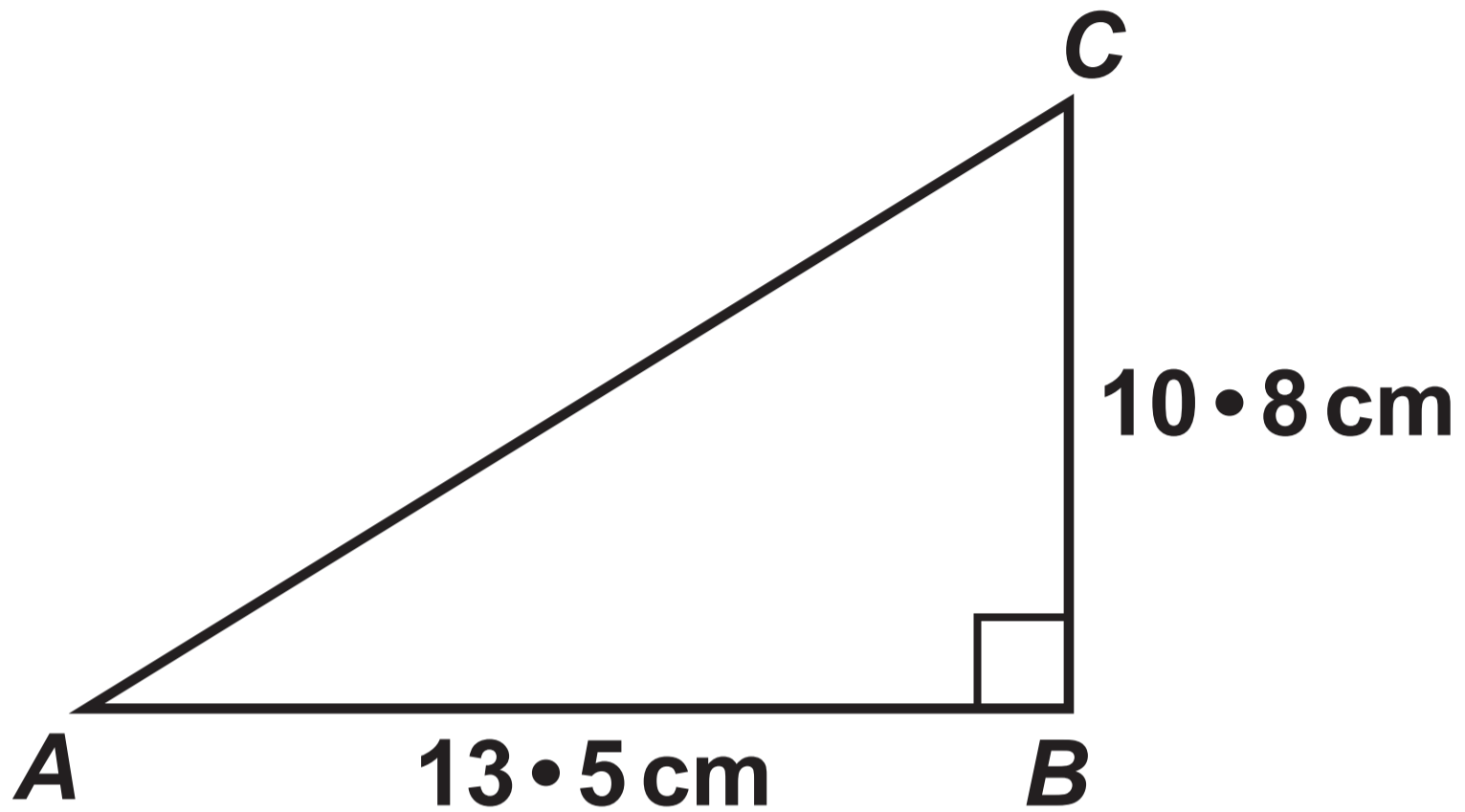
First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

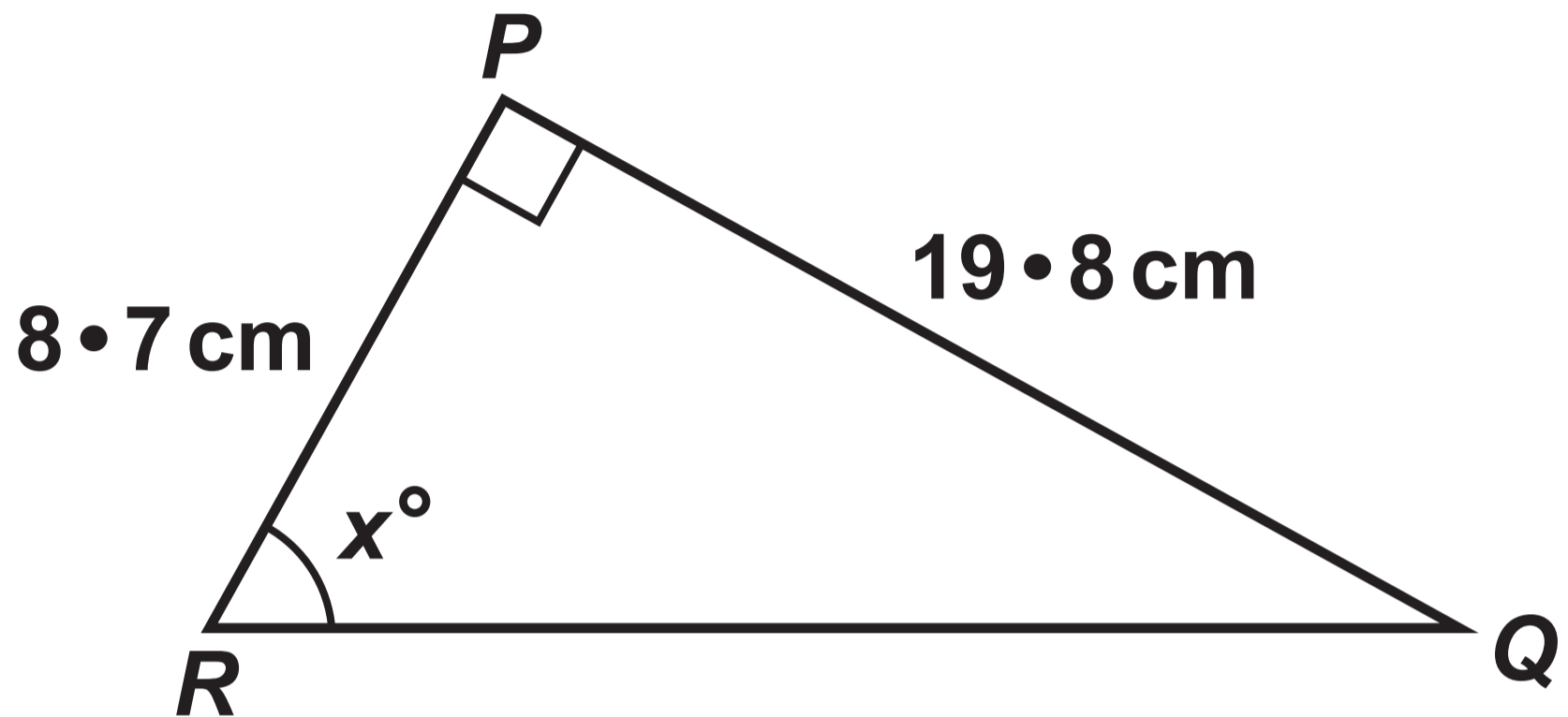
Question 5 (a)

Diagram NOT drawn to scale



Question 5 (b)

Diagram NOT drawn to scale

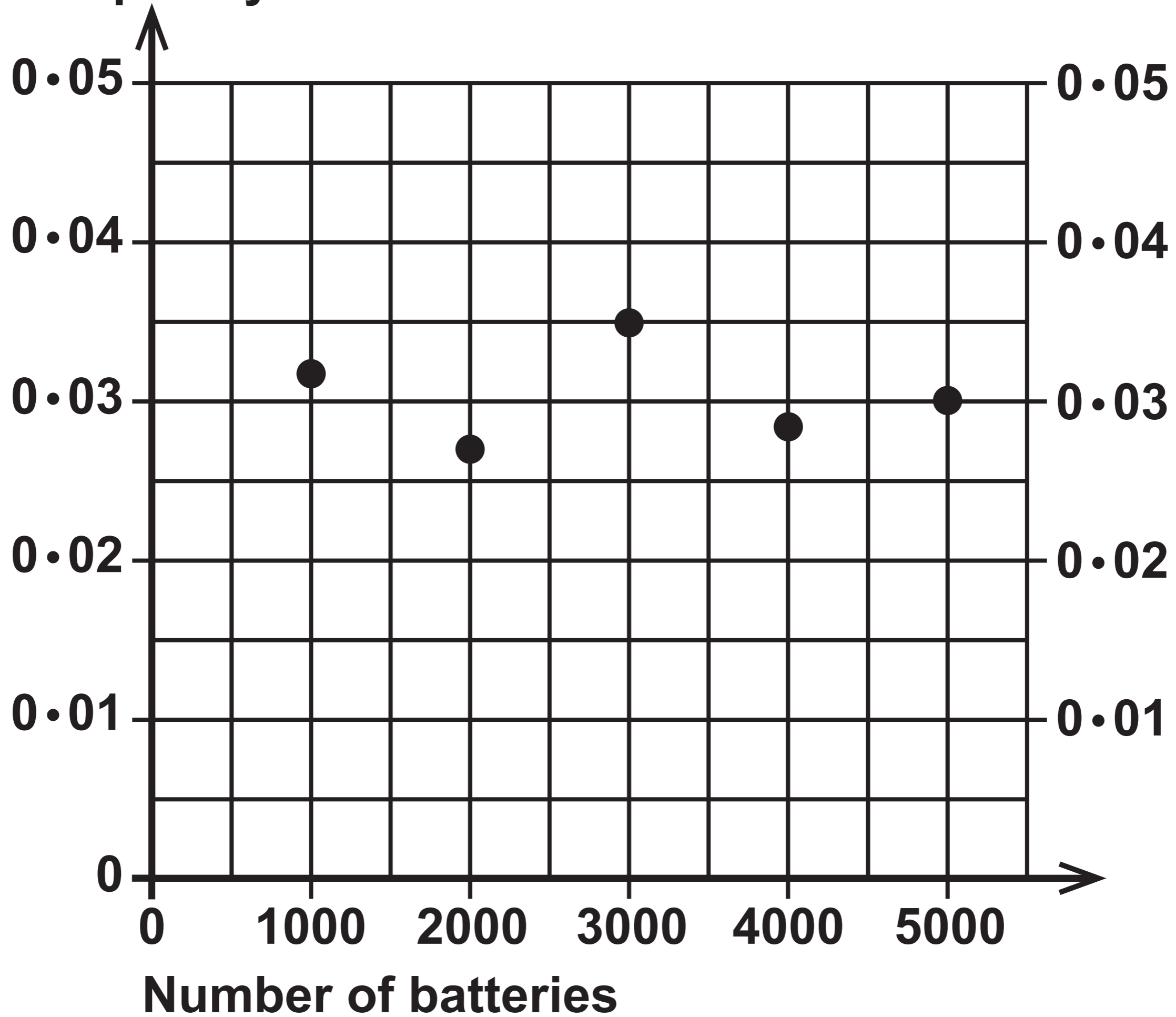


Question 6

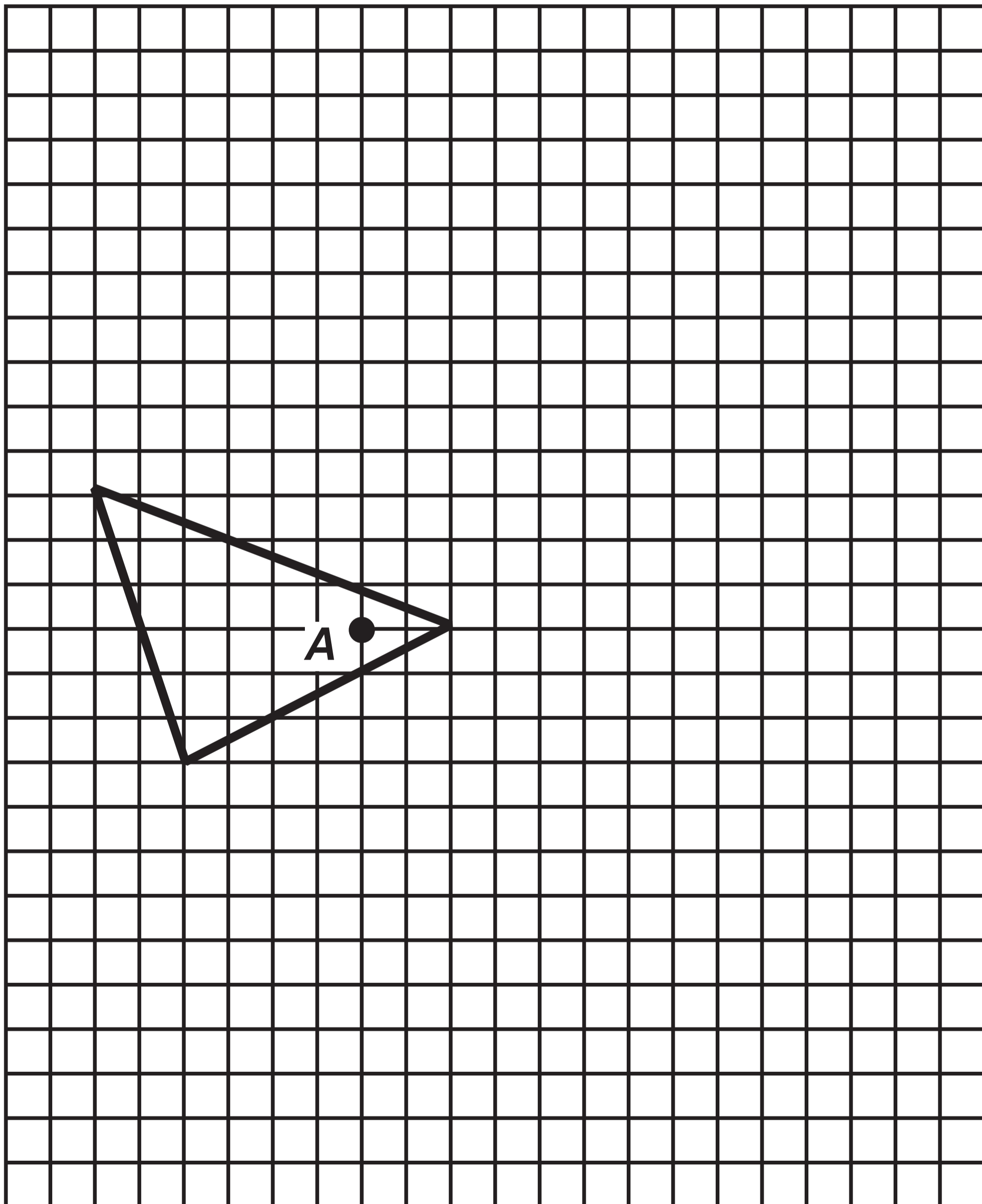


**Relative
frequency**

Question 7

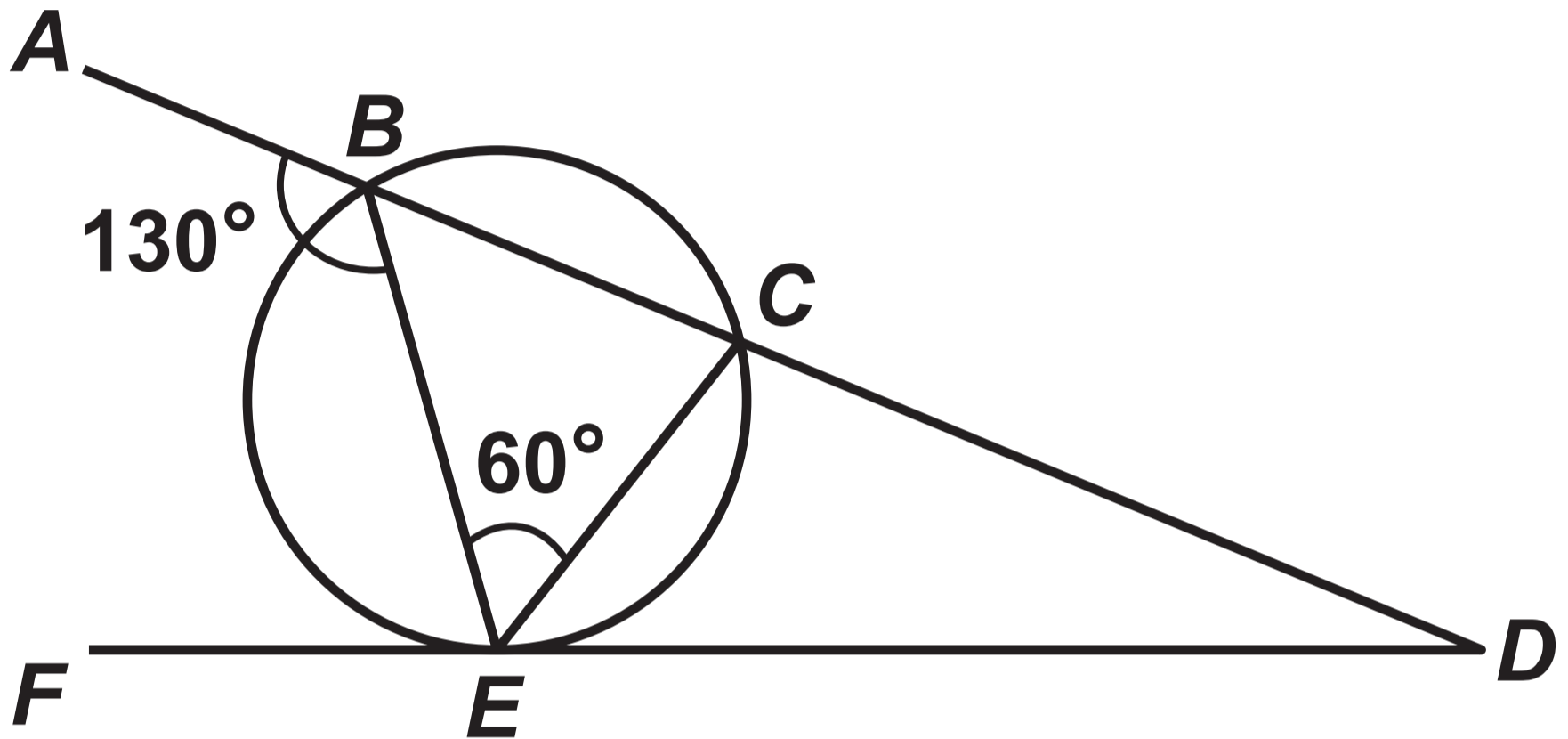


Question 10



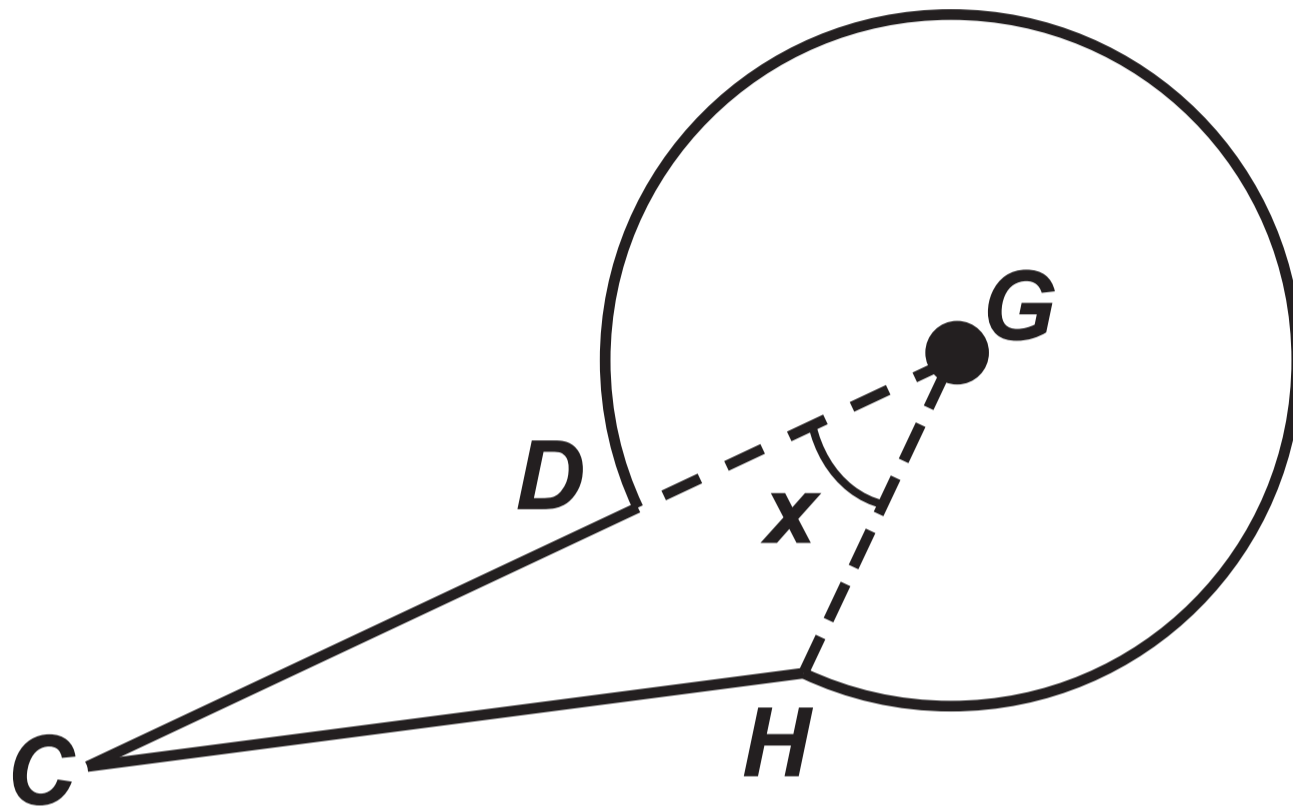
Question 13

Diagram NOT drawn to scale



Question 20

Diagram NOT drawn to scale



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MATHEMATICS – NUMERACY**

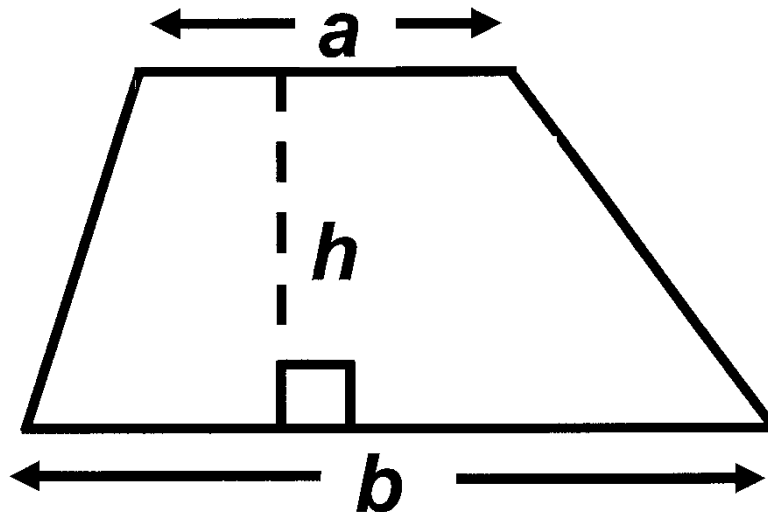
**FORMULA LIST
INTERMEDIATE TIER
GCSE**

You must not write on these formula pages.

Anything you write on these formula pages will gain NO credit.

Formula List – Intermediate Tier

Area of trapezium $= \frac{1}{2} (a + b) h$



Volume of prism =
area of cross – section \times length

