



GCSE

3300U30-1

MONDAY, 14 NOVEMBER 2022 – MORNING

MATHEMATICS

UNIT 1: NON – CALCULATOR

INTERMEDIATE TIER

1 hour 45 minutes plus your additional time allowance

THE USE OF A CALCULATOR IS NOT PERMITTED IN THIS EXAMINATION

Surname: _____

First name(s): _____

Centre Number: _____

Candidate Number: **0** _____

For Examiner's use only

| Question | Maximum Mark | Mark Awarded |
|-----------------|---------------------|---------------------|
| 1. | 2 | |
| 2. | 2 | |
| 3. | 2 | |
| 4. | 3 | |
| 5. | 3 | |
| 6. | 4 | |
| 7. | 3 | |
| 8. | 3 | |
| 9. | 5 | |
| 10. | 2 | |
| 11. | 2 | |
| 12. | 5 | |
| 13. | 5 | |
| 14. | 5 | |
| 15. | 3 | |
| 16. | 3 | |
| 17. | 6 | |
| 18. | 5 | |
| 19. | 3 | |
| 20. | 4 | |
| 21. | 2 | |
| 22. | 4 | |
| 23. | 4 | |
| Total | 80 | |

(Turn over)

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.

Models for Question 4.

Cut out shapes for Question 1.

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

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 the booklet.

Question numbers must be given for the work written on the additional page(s).

Take π as 3.14

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 9, the assessment will take into account the quality of your organisation, communication and accuracy in writing.

1. Look at the diagram for Question 1 in the separate Diagram Booklet.

The diagram shows some shaded squares on a grid.

Shade the least number of squares so that the grid has rotational symmetry of order 2

The squares you shade must be in the lower two quadrants.

Cut out squares are available for this question.

[2 marks]

2. Two friends, Geraint and Dyfrig, are having a discussion.

(a) Geraint says,

“All prime numbers are odd numbers.”

Explain why Geraint is incorrect.

[1 mark]

continued on the next page . . .

(Turn over)

Question 2 continued

2. (b) Dyfrig says,

“All cube numbers are odd numbers.”

Explain why Dyfrig is incorrect.

[1 mark]

3. Using only the numbers in the following list,

31 33 35 37 39 41 43

find

(a) the multiple of **5.5**

The multiple of **5.5** is _____

[1 mark]

continued on the next page . . .

(Turn over)

Question 3 continued

Using only the numbers in the following list,

31 33 35 37 39 41 43

find

3. (b) the factor of 111

The factor of 111 is _____

[1 mark]

4. Ask for the models for Question 4.

The models ARE made to scale.

There are four cuboids labelled cuboid A,
cuboid B, cuboid C and cuboid D.

One of the cuboids has a volume of 12 cm^3

Which cuboid, A, B, C or D has a volume
of 12 cm^3 ?

Cuboid _____ has a volume of 12 cm^3

On the isometric grid provided for Question 4
in the separate Diagram Booklet, draw an
isometric representation of this cuboid.

[3 marks]

(Turn over)

Total number of £10 notes = _____

Total number of £5 notes = _____

[3 marks]

Question 6 continued

6. (b) Simplify the expression

$$6c - 7d - 2c - 8d$$

[2 marks]**(Turn over)**

7. In a restaurant, as part of a Set Meal, customers must choose a starter, main course and dessert from the options below.

| SET MEAL | | |
|---|--|--|
| STARTER | MAIN COURSE | DESSERT |
| Melon (M) or Soup (S) | Chicken (C) or Ham (H) or Pizza (P) | Fruit (F) or Yoghurt (Y) |

Look at the table for Question 7 in the separate Diagram Booklet.

List all the possible different combinations of starters, main courses, and desserts that the restaurant offers.

One has been done for you.

[3 marks]

(Turn over)

[3 marks + 2 marks OCW]

11. The n th term of a sequence is given by $3n - 13$

Write down the value of

(a) the 10th term,

[1 mark]

(b) the 4th term.

[1 mark]

(Turn over)

12. Samira has a dice.

Its faces are numbered 1 to 6

She wants to know whether her dice is biased or not.

Samira rolled this dice 300 times.

Look at the table for Question 12

in the separate Diagram Booklet.

Her results are shown in the table.

(a) The relative frequency of throwing a 5

is $\frac{23}{300}$

What is the relative frequency of throwing a 2?

Give your answer as a fraction in its simplest form.

[2 marks]

12. (b) Do the results in the table suggest that Samira's dice is biased?

Yes No

Explain your decision.

[1 mark]

continued on the next page . . .

(Turn over)

14. In a group of **200** people:

- **105** people do not have black hair and do not wear glasses
- **20** people have black hair and wear glasses
- **70** people have black hair.

(a) Look at the diagram for Question 14 (a) in the separate Diagram Booklet. The diagram is an incomplete Venn diagram.

Complete the Venn diagram to show this information.

The universal set, \mathcal{E} , contains all **200** people.

[3 marks]

14. (b) One of these people is chosen at random.
What is the probability that this person
wears glasses?

[2 marks]

(Turn over)

15. Look at the diagram for Question 15 in the separate Diagram Booklet.
The diagram is NOT drawn to scale.

Triangle ***ABC*** is shown in the diagram.

Using only a ruler and a pair of compasses, construct an accurate drawing of

triangle ***ABC*** in the space below the diagram.

Side ***AC*** has been drawn for you.

All construction lines and arcs must be shown.

[3 marks]

[3 marks]

17. Simplify the following expressions.

(a) $2e^3f \times 3e^4f^7$

[2 marks]

(b) $7c(c + 5) - 2(3c^2 + 6c - 7)$

(Turn over)

[4 marks]

18. Look at the diagram for Question 18
in the separate Diagram Booklet.

The diagram shows the graph of a straight
line for values of x from -1 to 3

(a) (i) Write down the gradient of the
line shown.

[1 mark]

(ii) Write down the equation of the line
in the form $y = mx + c$

[2 marks]

continued on the next page . . .

(Turn over)

19. Look at the table for Question 19 in the separate Diagram Booklet. The table shows six different formulae.

In the formulae, each measurement of length is represented by a letter.

Consider the dimensions implied by each formula.

For each case, write down whether the formula could be for a length, an area, a volume or none of these.

The first one has been done for you.

[3 marks]

20. (a) Calculate the value of
 $(3 \times 10^4) \div (6 \times 10^{-3})$

Give your answer in standard form.

[2 marks]

continued on the next page . . .

(Turn over)

21. (a) Look at the diagram for Question 21 (a) in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

Which complete method, using Pythagoras's Theorem, can be used to find x ?

Circle your answer.

| |
|--------------------------|
| $x = 25^2 + 10^2$ |
| $x = \sqrt{25^2 + 10^2}$ |
| $x = 25^2 - 10^2$ |
| $x = \sqrt{25^2 - 10^2}$ |
| $x = \sqrt{(25 - 10)^2}$ |

[1 mark]

continued on the next page . . .

(Turn over)

Question 21 continued

21. (b) Look at the diagram for Question 21 (b) in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

Which of the following calculations can be used to find y ?

Circle your answer.

| |
|--------------------------------|
| $\sin 25^\circ = y \times 40$ |
| $\sin 40^\circ = \frac{25}{y}$ |
| $\sin 25^\circ = \frac{y}{40}$ |
| $\sin 40^\circ = \frac{y}{25}$ |
| $\sin 40^\circ = y \times 25$ |

[1 mark]

(Turn over)

22. Look at the diagram for Question 22 in the separate Diagram Booklet. The diagram is NOT drawn to scale.

In the diagram,

P , Q and R are points on the circumference of a circle with centre O .

$$\text{Angle } QPO = 38^\circ$$

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

Calculate the value of x .

You must state ALL the angle properties that you use.

You must show all your working.

23. On Monday morning, Twm picked n apples from a tree.

Ceri picked 5 times as many apples as Twm.

On Monday afternoon, Twm picked 19 more apples.

Ceri gave 7 of her apples to Twm.

Ceri still had more apples than Twm.

Write down an inequality in terms of n to show the above information.

Use your inequality to find the least possible number of apples Twm picked on Monday morning.

You must show all your working.

[4 marks]

END OF PAPER

TOTAL 80 MARKS

(Turn over)



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MATHEMATICS

UNIT 1: NON – CALCULATOR

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**The Diagram Booklet MUST be handed in
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Diagram Booklet

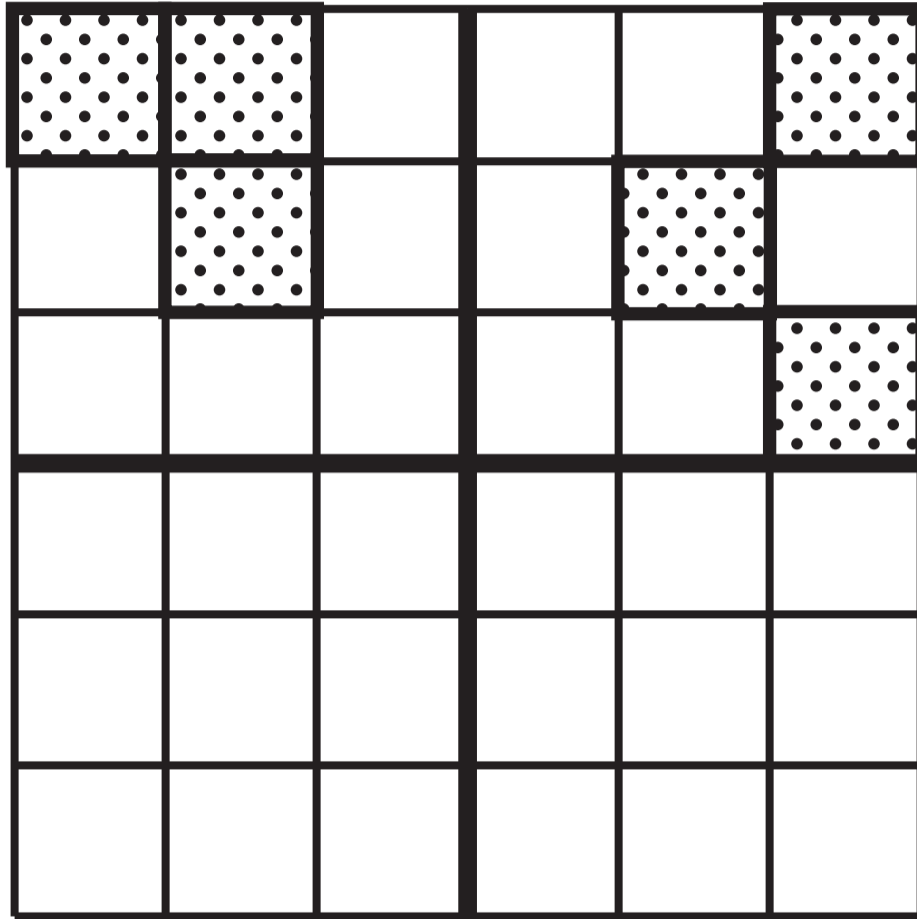
Surname: _____

First name(s): _____

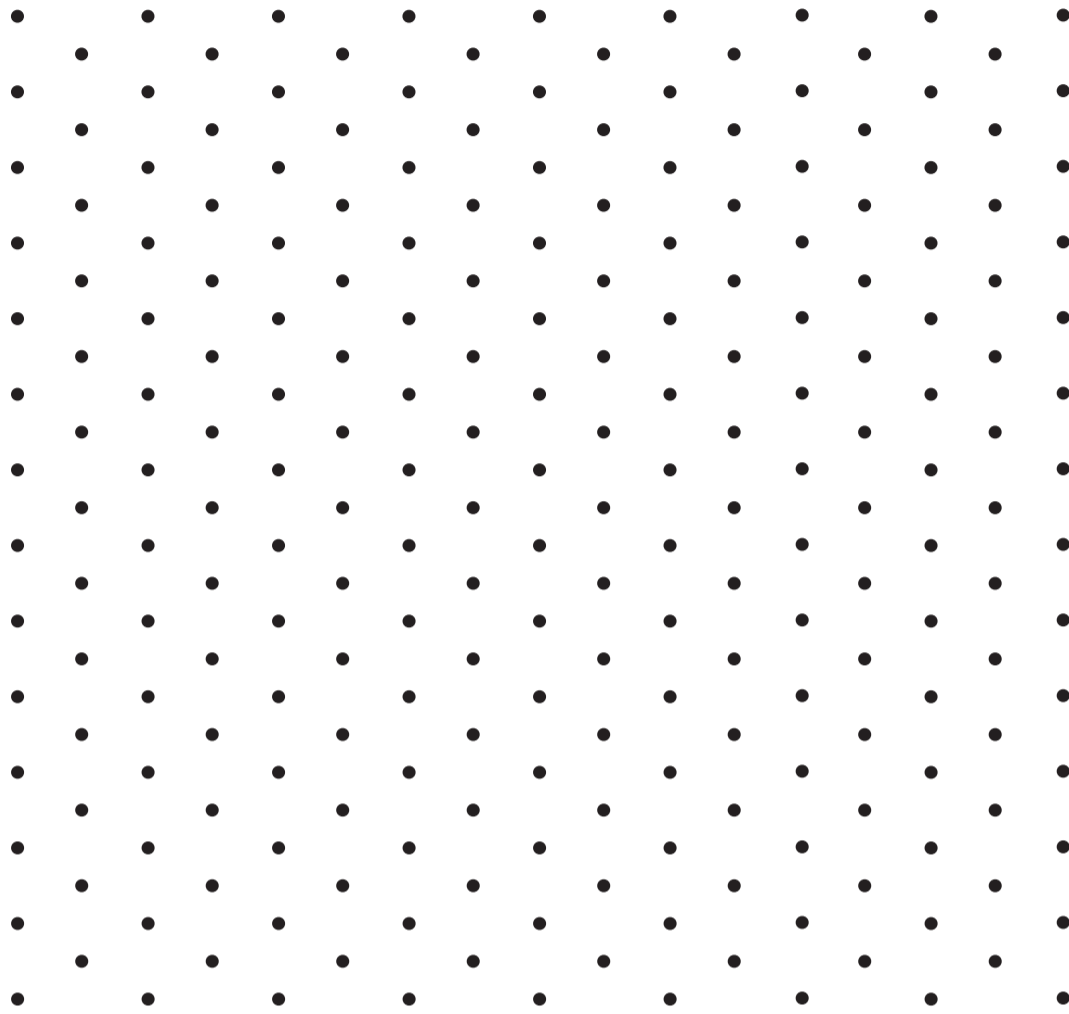
Centre Number: _____

Candidate Number: 0 _____

Question 1



Question 4



Question 12

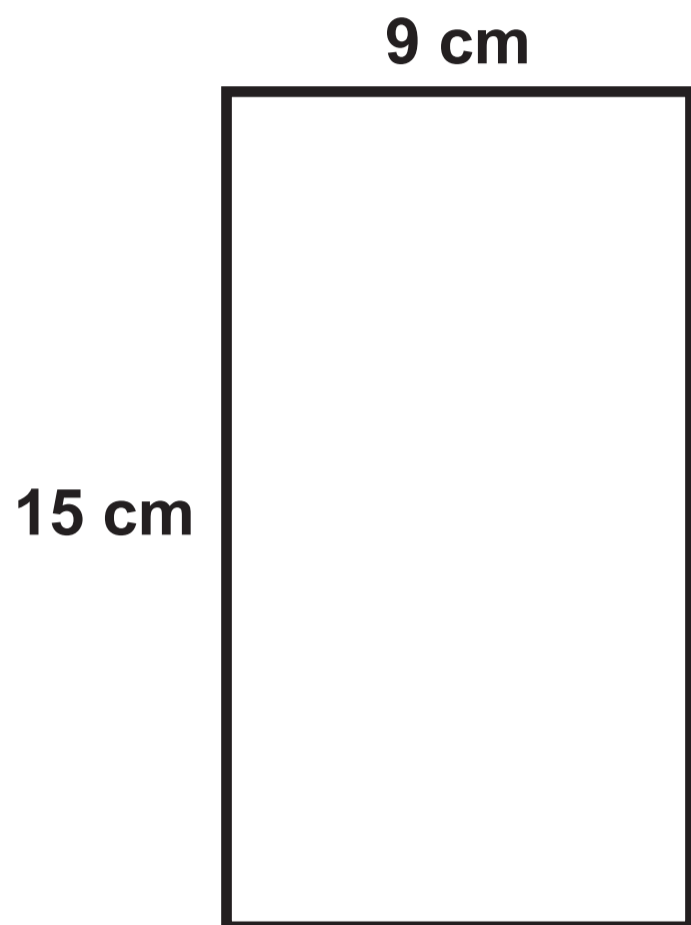
Table

| Number shown on dice | Frequency |
|---------------------------------|------------------|
| 1 | 65 |
| 2 | 40 |
| 3 | 52 |
| 4 | 10 |
| 5 | 23 |
| 6 | 110 |

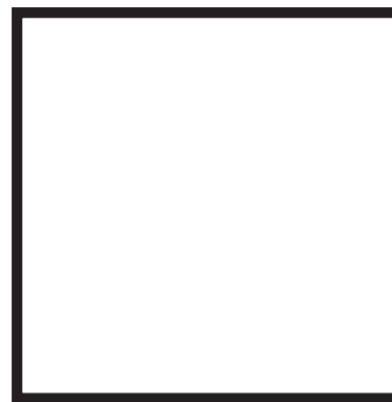
Question 13

Diagram NOT drawn to scale

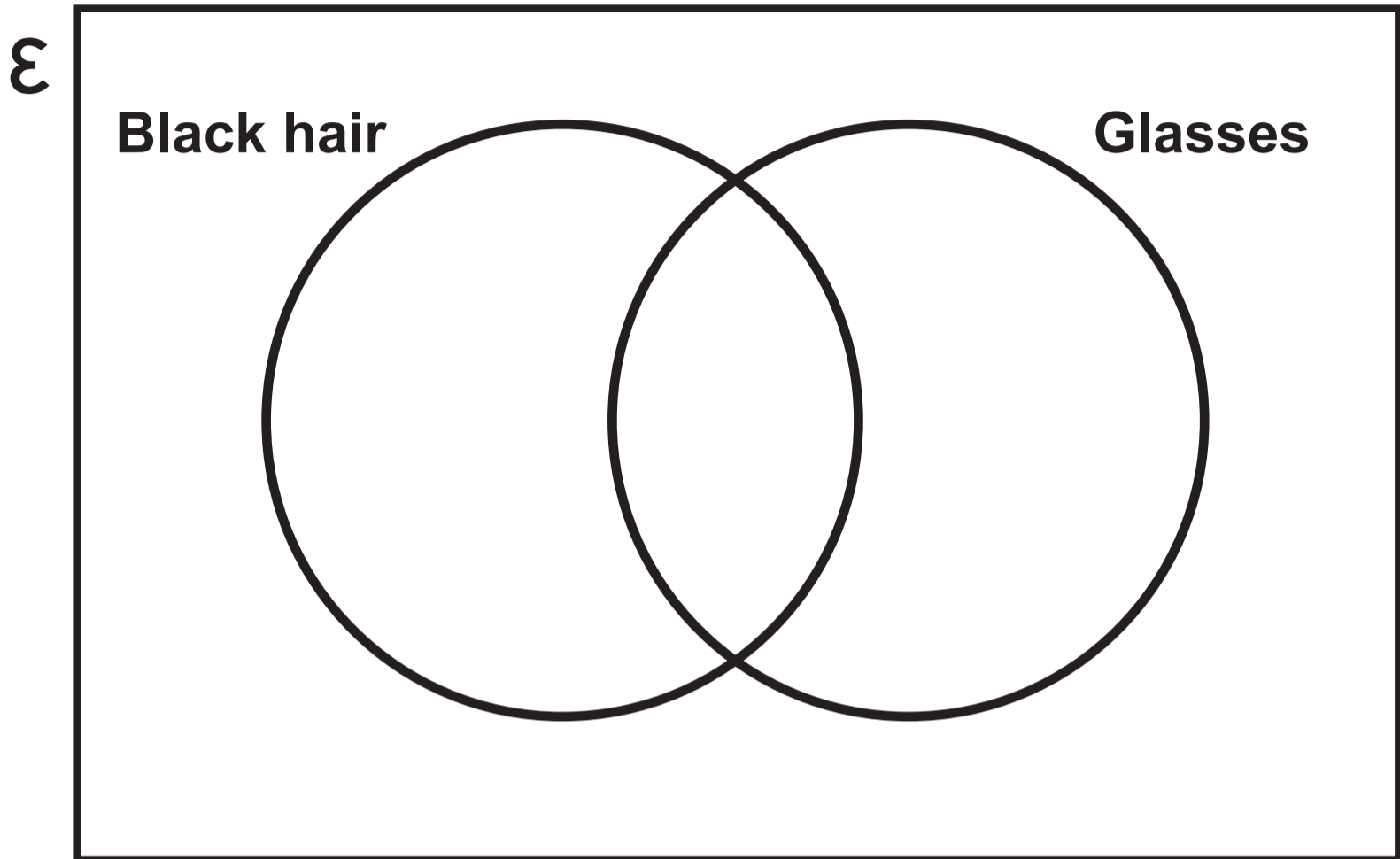
Rectangle



Square

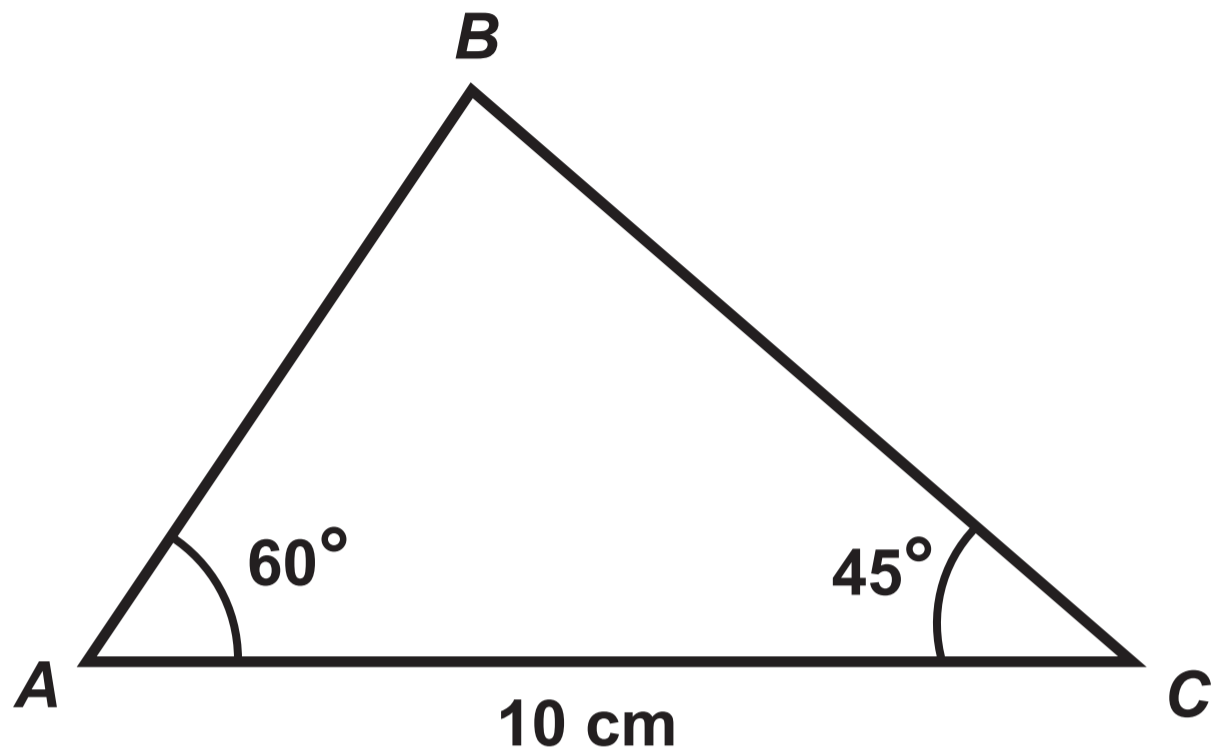


Question 14 (a)

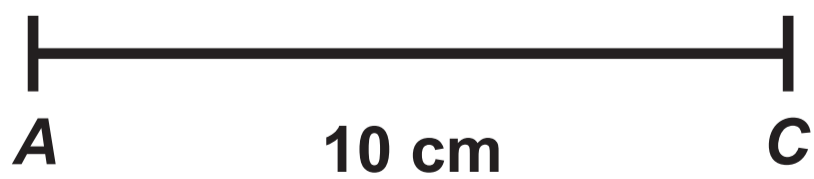


Question 15

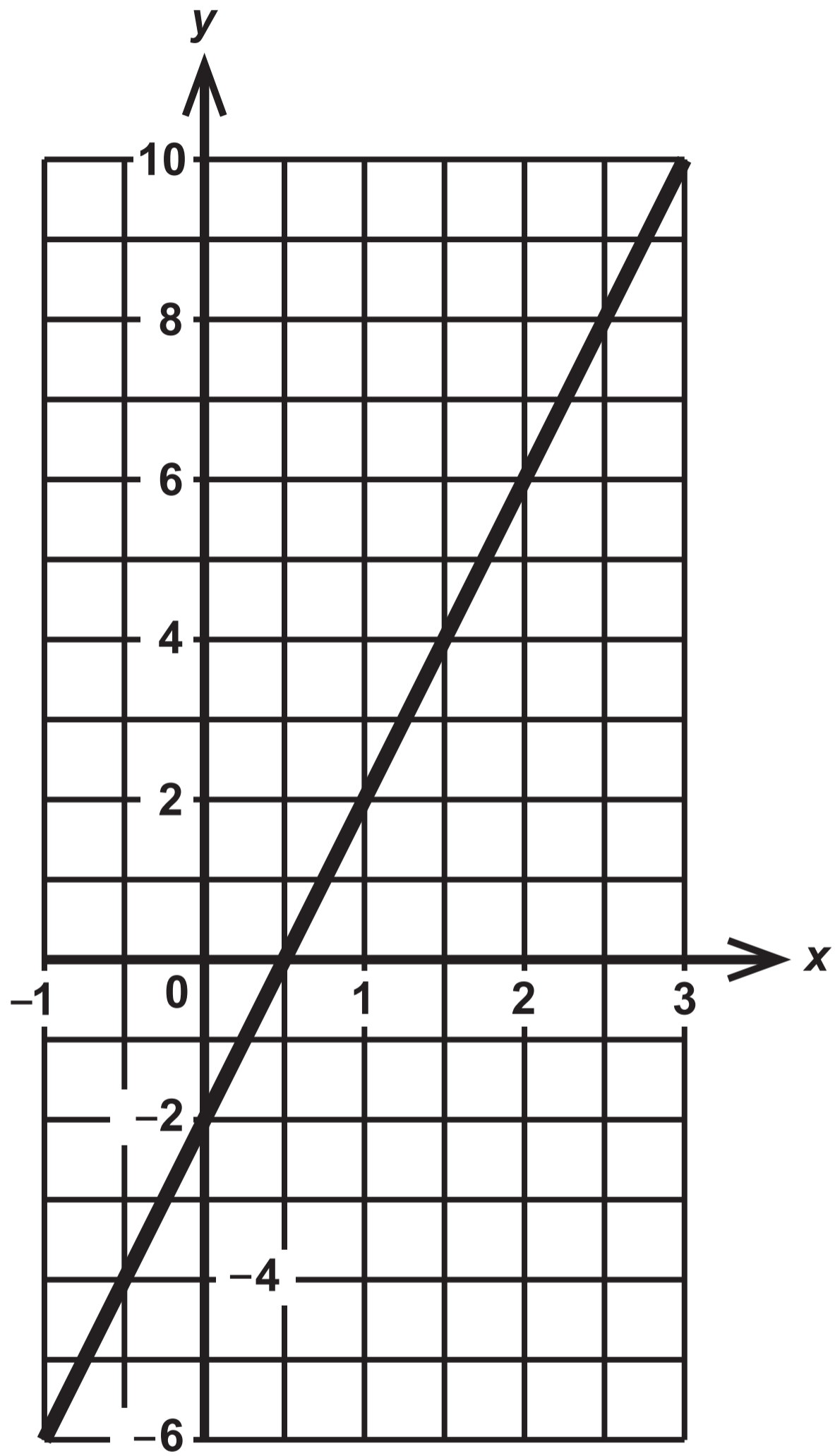
Diagram NOT drawn to scale



In the space below, construct an accurate drawing of triangle ABC shown above.



Question 18



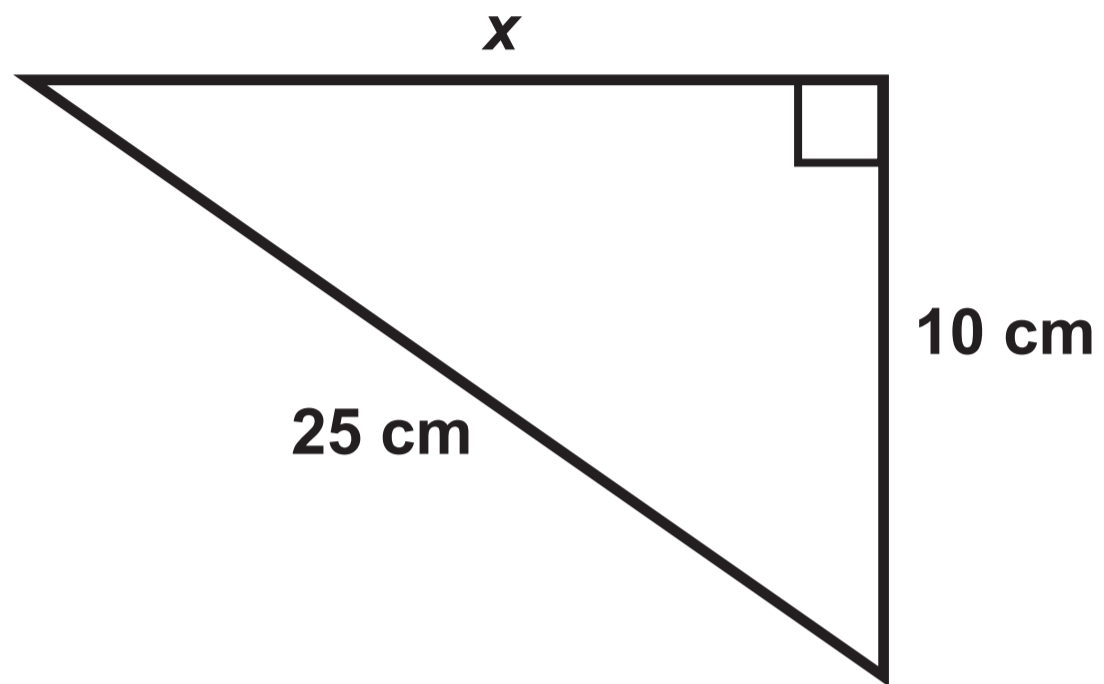
Question 19

Table

| FORMULA | FORMULA COULD BE FOR |
|-------------------------------|----------------------|
| $7d^3 - def$ | volume |
| $7de - 5e^2 + \frac{d^2e}{f}$ | |
| $5def - 6ef + e^2$ | |
| $4d^2e + 4e^2d$ | |
| $3d + 8e + 2f$ | |
| $d^2 - def$ | |

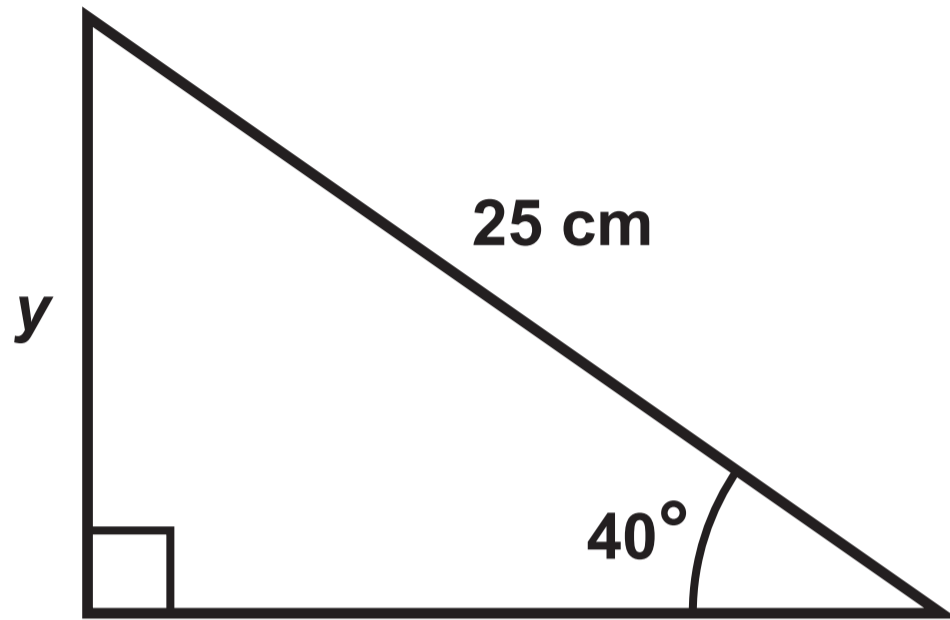
Question 21 (a)

Diagram NOT drawn to scale



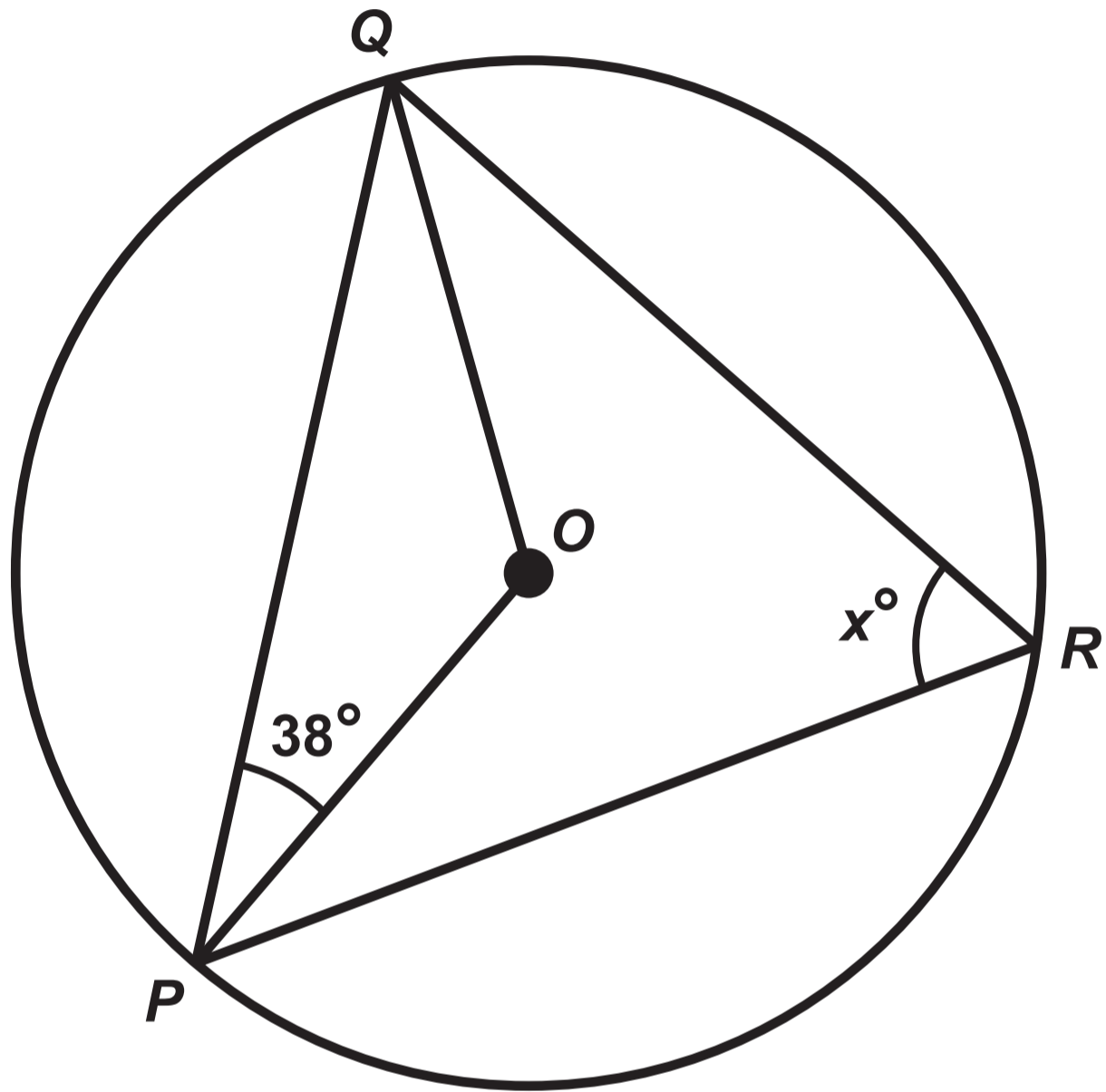
Question 21 (b)

Diagram NOT drawn to scale



Question 22

Diagram NOT drawn to scale



**GCSE
MATHEMATICS
and
NUMERACY**



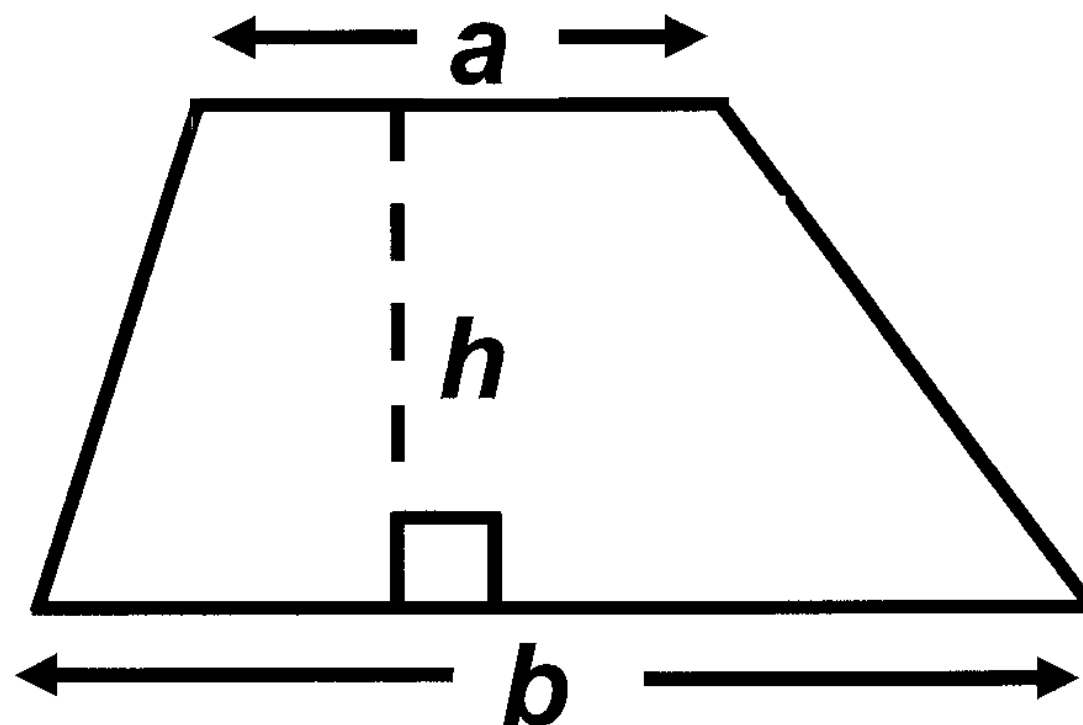
**FORMULA LIST
INTERMEDIATE TIER
GCSE**

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

