



GCSE

3300U40-1

TUESDAY, 14 JUNE 2022 – MORNING

MATHEMATICS

UNIT 2: CALCULATOR – ALLOWED

INTERMEDIATE TIER

**1 hour 35 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.	4	
2.	4	
3.	6	
4.	10	
5.	5	
6.	4	
7.	5	
8.	1	
9.	3	
10.	5	
11.	6	
12.	5	
13.	6	
14.	6	
Total	70	

(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.

Model for Question 14.

Cut out shape for Question 6 (a) and Question 6 (b).

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

Take π as 3.14 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 4 (d), the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

(Turn over)

1. Calculate the following.

(a) 3.5% of 159.8

[2 marks]

continued on the next page . . .

(Turn over)

Question 1 continued

1. (b) $\sqrt{262.44} - \frac{3}{7} \times 24.5$

[2 marks]

(Turn over)

2. Look at the diagram for Question 2 in the separate Diagram Booklet.

The diagram shows point A and point B on a coordinate grid.

(a) B is the midpoint of the line AC .

Find the coordinates of C .

C (_____ , _____)

[2 marks]

continued on the next page . . .

(Turn over)

Question 2 continued

2. (b) A and B are two vertices of a right – angled triangle.

Point D is to be plotted on the grid so that the triangle ABD is a right – angled triangle.

The x – coordinate of D is negative.

Give the coordinates of a possible position of the point D that can be plotted on the grid.

(Turn over)

D (_____ , _____)

[2 marks]

(Turn over)

3. By first expressing all the amounts below in litres, calculate the mean of the three amounts.

1.25 litres

2.73 pints

1615 ml

12

(Turn over)

1.25 litres
2.73 pints $\approx$ _____ litres
1615 ml = _____ litres

Mean of the three amounts

= _____ litres

[6 marks]

(Turn over)

- 4. Look at the diagram for Question 4 in the separate Diagram Booklet. The diagram shows two fair spinners, a triangular spinner and a square spinner.**

In a game, the two spinners are spun.

The two numbers obtained are multiplied together to get a score. For example, in the diagram, the score is 6 because $3 \times 2 = 6$

continued on the next page . . .

(Turn over)

Question 4 continued

**Look at the table for Question 4
in the separate Diagram Booklet.
Some of the scores are shown in
the table.**

- 4. (a) Complete the table to show
all the possible scores.**

[1 mark]

continued on the next page . . .

(Turn over)

Question 4 continued

**4. (b) Explain why all the scores
are even numbers.**

[1 mark]

continued on the next page . . .

(Turn over)

Question 4 continued

- 4. (c) What is the probability that a person gets a score of 10 or more when playing the game once?**

[2 marks]
(Turn over)

Question 4 continued

- 4. (d) IN THIS PART OF THE QUESTION, YOU WILL BE ASSESSED ON THE QUALITY OF YOUR ORGANISATION, COMMUNICATION AND ACCURACY IN WRITING.**

Players are charged £2.50 to play the game once.

Each player who gets a score of 10 or more wins £3.50

continued on the next page . . .

(Turn over)

Question 4 (d) continued

**How much profit would you
expect to make when 228 people
each play the game once?
You must show all your working.**

(Turn over)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(Turn over)

(Turn over)

[4 marks + 2 marks OCW]

(Turn over)

5. The length of a rectangle is double its width.

The area of the rectangle is greater than 60 cm^2

The perimeter of the rectangle is less than 40 cm.

Give a possible width and length of the rectangle.

Calculate the area and the perimeter of this rectangle.

You must show all your working.

Use the answer spaces to clearly identify which is the area and which is the perimeter.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(Turn over)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(Turn over)

Width = _____ cm

Length = _____ cm

Area = _____ cm²

Perimeter = _____ cm

[5 marks]

(Turn over)

- 6. (a) Look at the diagram for Question 6 (a) in the separate Diagram Booklet.**

The diagram shows a shape on a coordinate grid.

Reflect the shape in the line $x = 1$

A cut out shape is provided for this question.

[2 marks]

continued on the next page . . .

(Turn over)

Question 6 continued

- 6. (b) Look at the diagram for Question 6 (b) in the separate Diagram Booklet.**

The diagram shows a shape on a coordinate grid.

Rotate the shape through 90° clockwise about the point $(-1, 1)$

A cut out shape is provided for this question.

[2 marks]

(Turn over)

7. (a) Expand $4(3p - 5)$

[1 mark]

continued on the next page . . .

(Turn over)

Question 7 continued

**7. (b) Make m the subject of the
formula $w = 8m - 3$**

[2 marks]

continued on the next page . . .

(Turn over)

Question 7 continued

7. (c) Expand and simplify
 $(y + 5)(y - 4)$

[2 marks]

(Turn over)

8. Look at the diagram for Question 8 in the separate Diagram Booklet.

What is the correct name for the relationship between angle p and angle q in the diagram?

Circle your answer.

corresponding angles
alternate angles
interior angles
parallel angles
opposite angles

[1 mark]

(Turn over)

9. A car travels 129.5 miles in 3 hours 30 minutes.

Calculate the average speed of the car.

Give your answer in miles per hour.

34

[3 marks]

(Turn over)

**10. The height of a cylinder is 24.8 cm.
The ratio of the DIAMETER of the
cylinder to the height of the cylinder
is 3 : 2**

**Find the volume of the cylinder.
Give your answer correct to
2 significant figures.**

You must show all your working.

[illegible]

(Turn over)

37

[5 marks]

(Turn over)

11. Look at the diagram for Question 11 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The diagram shows shape *ABCD*.

***ABC* is a triangle.**

***AB* = 9.6 cm**

***AC* = 12.8 cm**

Angle *BAC* is a right angle.

***BCD* is a triangle.**

Angle *BCD* is a right angle.

In the diagram, the area of triangle

***BCD* is 60 cm²**

continued on the next page . . .

(Turn over)

Question 11 continued

Calculate the length of CD .

You must show all your working.

(Turn over)

(Turn over)

[6 marks]

(Turn over)

12. (a) Factorise $8x^2 + 6xy$

[2 marks]

continued on the next page . . .

(Turn over)

Question 12 continued**12. (b) (i) Factorise $x^2 + 13x + 40$**

[2 marks]**continued on the next page . . .****(Turn over)**

Question 12 (b) continued

12. (b) (ii) Explain how you can check that your answer to part (i) is correct.

[1 mark]

(Turn over)

- 13. (a) Look at the diagram for Question 13 (a) in the separate Diagram Booklet. The diagram is NOT drawn to scale.**

The diagram shows a right – angled triangle labelled PQR .

In the diagram,

$$\mathbf{PR = 14.5 \text{ cm}}$$

$$\mathbf{QR = x \text{ cm}}$$

$$\mathbf{\text{Angle } QPR = 42^\circ}$$

Angle PQR is a right angle.

continued on the next page . . .

(Turn over)

Question 13 (a) continued**Calculate the value of x .**

 $x =$ _____**[3 marks]****continued on the next page . . .****(Turn over)**

Question 13 continued

- 13. (b) Look at the diagram for Question 13 (b) in the separate Diagram Booklet. The diagram is NOT drawn to scale.**

The diagram shows a different right – angled triangle labelled STU .

In the diagram,

$$\mathbf{SU = 15.8 \text{ cm}}$$

$$\mathbf{TU = 13.5 \text{ cm}}$$

Angle STU is a right angle.

$$\mathbf{\text{Angle } SUT = y^\circ}$$

continued on the next page . . .

(Turn over)

Question 13 (b) continued**Calculate the value of y .**

 $y =$ _____**[3 marks]****(Turn over)**

14. Ask for the model for Question 14.

The model is NOT made to scale.

The model is a cuboid.

This cuboid has:

length = 5 cm

width = x cm

height = $(x^2 + 3)$ cm

volume = 132 cm^3

(a) Show that $5x^3 + 15x = 132$

[1 mark]
(Turn over)

Question 14 continued

14. (b) (i) A solution of the equation

$$5x^3 + 15x = 132$$

lies between 2 and 3

**Use the method of trial
and improvement to find
this solution correct to
1 decimal place.**

**You must show all your
working.**

(Turn over)

(Turn over)

[4 marks]

continued on the next page . . .

(Turn over)

Question 14 (b) continued

14. (b) (ii) Hence, find the height of the cuboid.

Height of the cuboid

= _____ cm

[1 mark]

END OF PAPER

TOTAL 70 MARKS

(Turn over)

Question number	Additional pages, if required. Write the question number(s) in the left - hand margin.

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Diagram Booklet

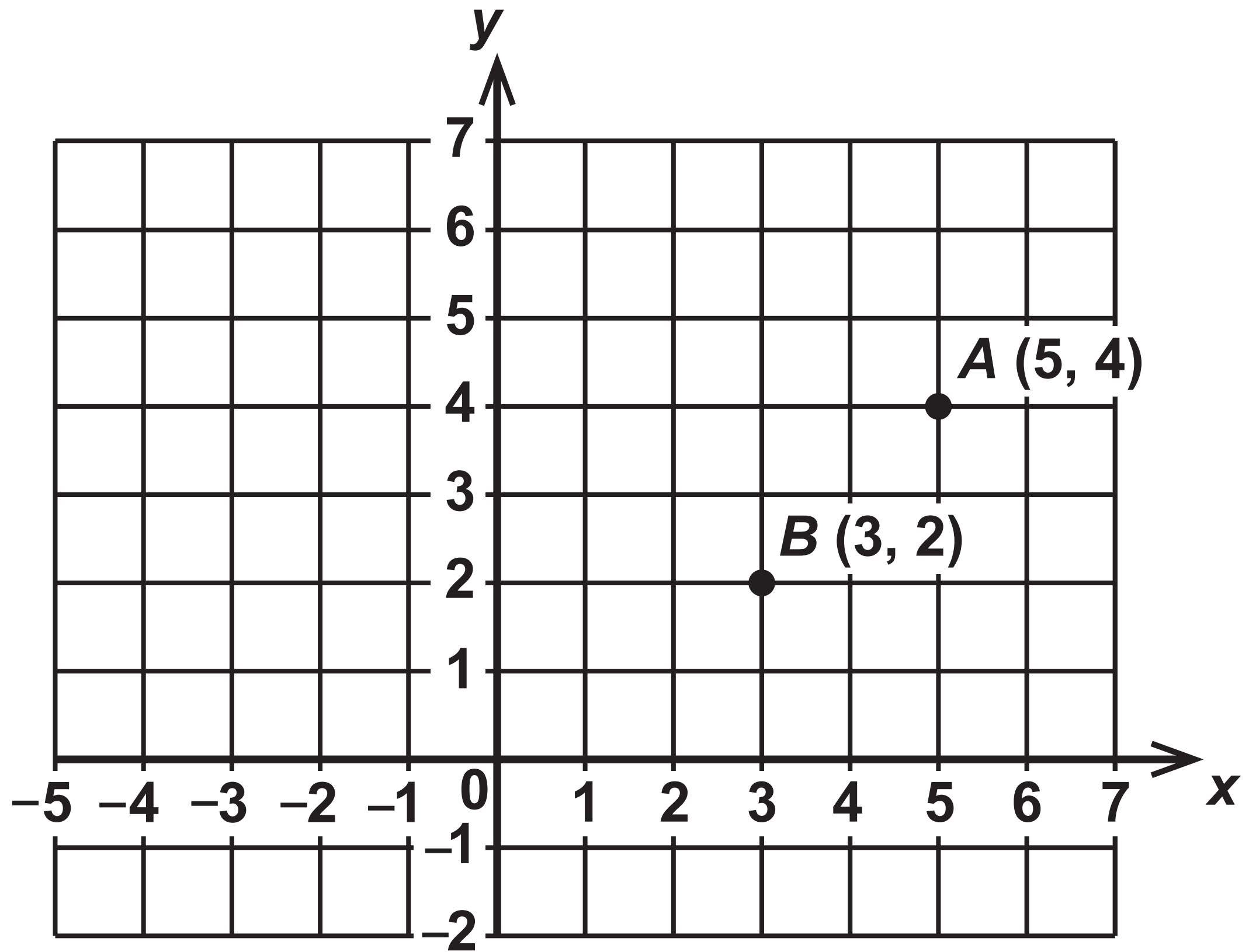
Surname: _____

First name(s): _____

Centre Number: _____

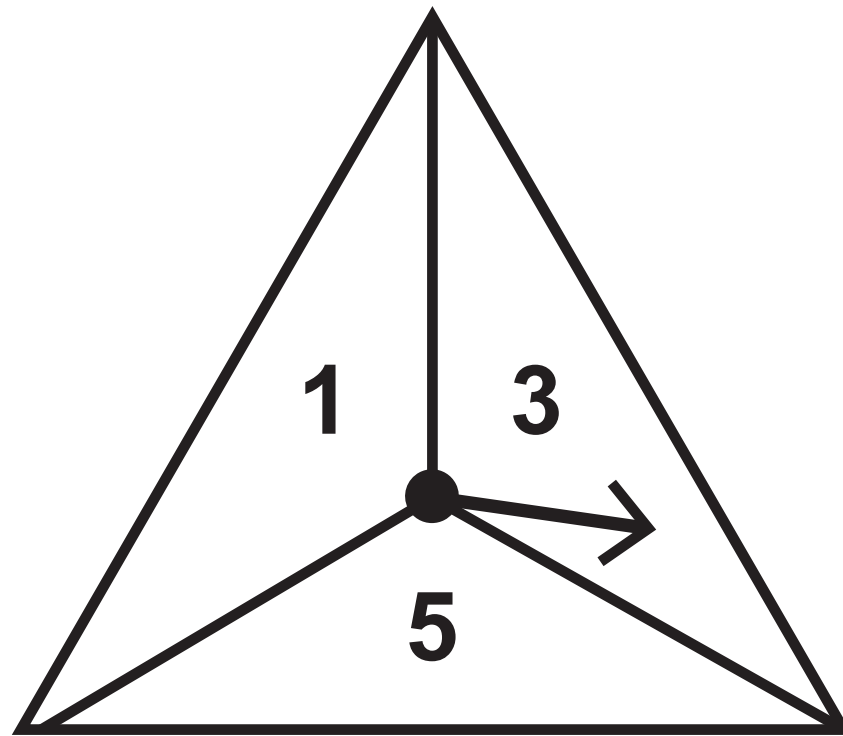
Candidate Number: 0 _____

Question 2

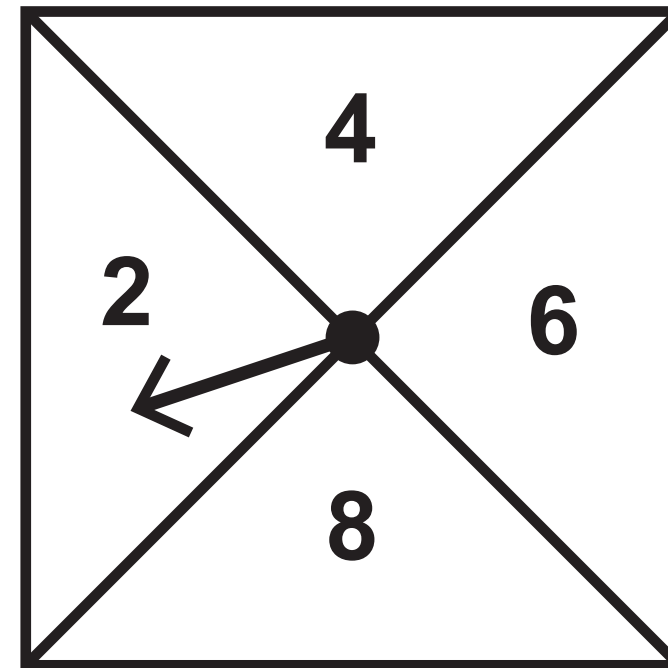


Question 4

Triangular spinner



Square spinner



Question 4

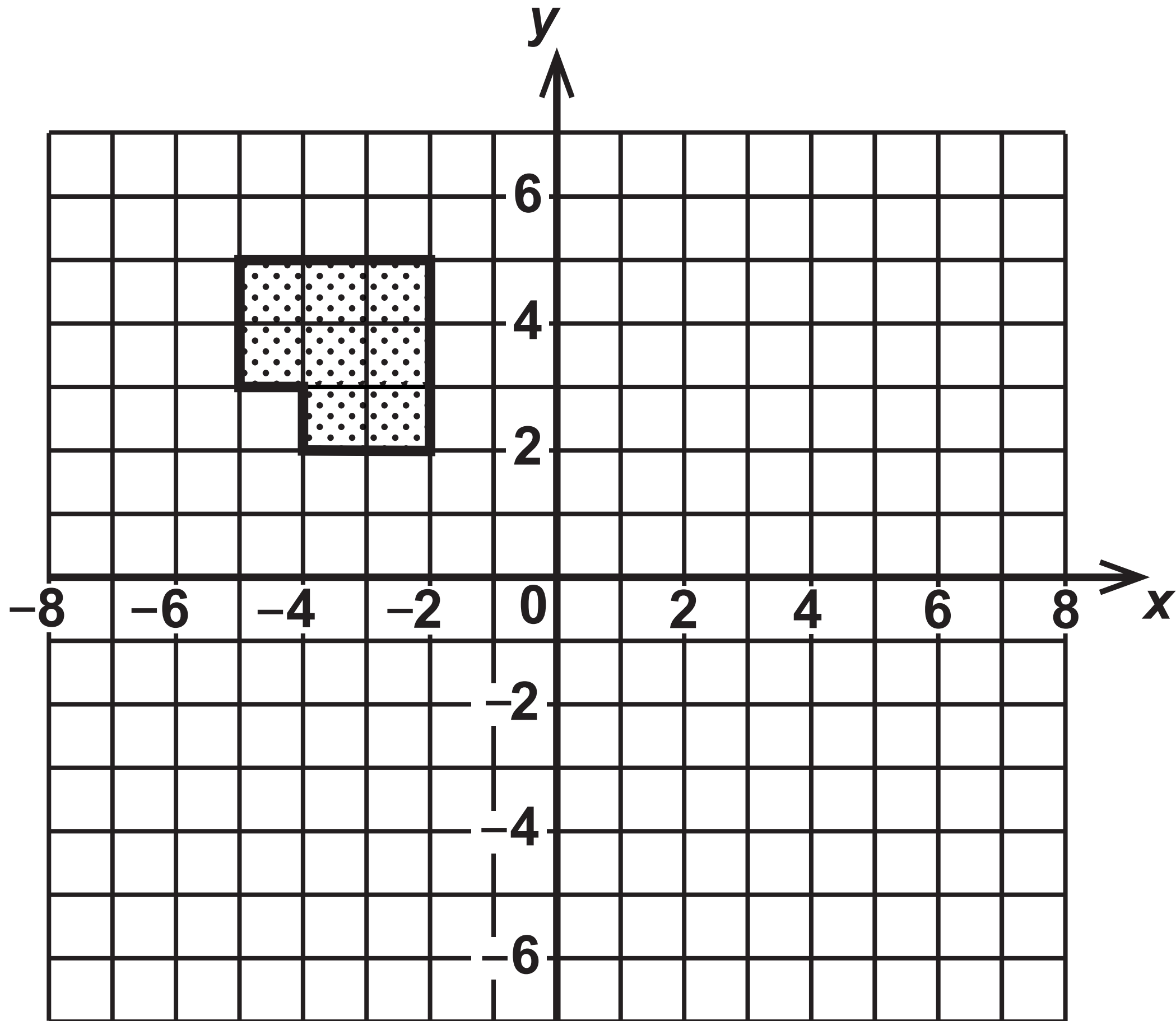
Table

Square spinner

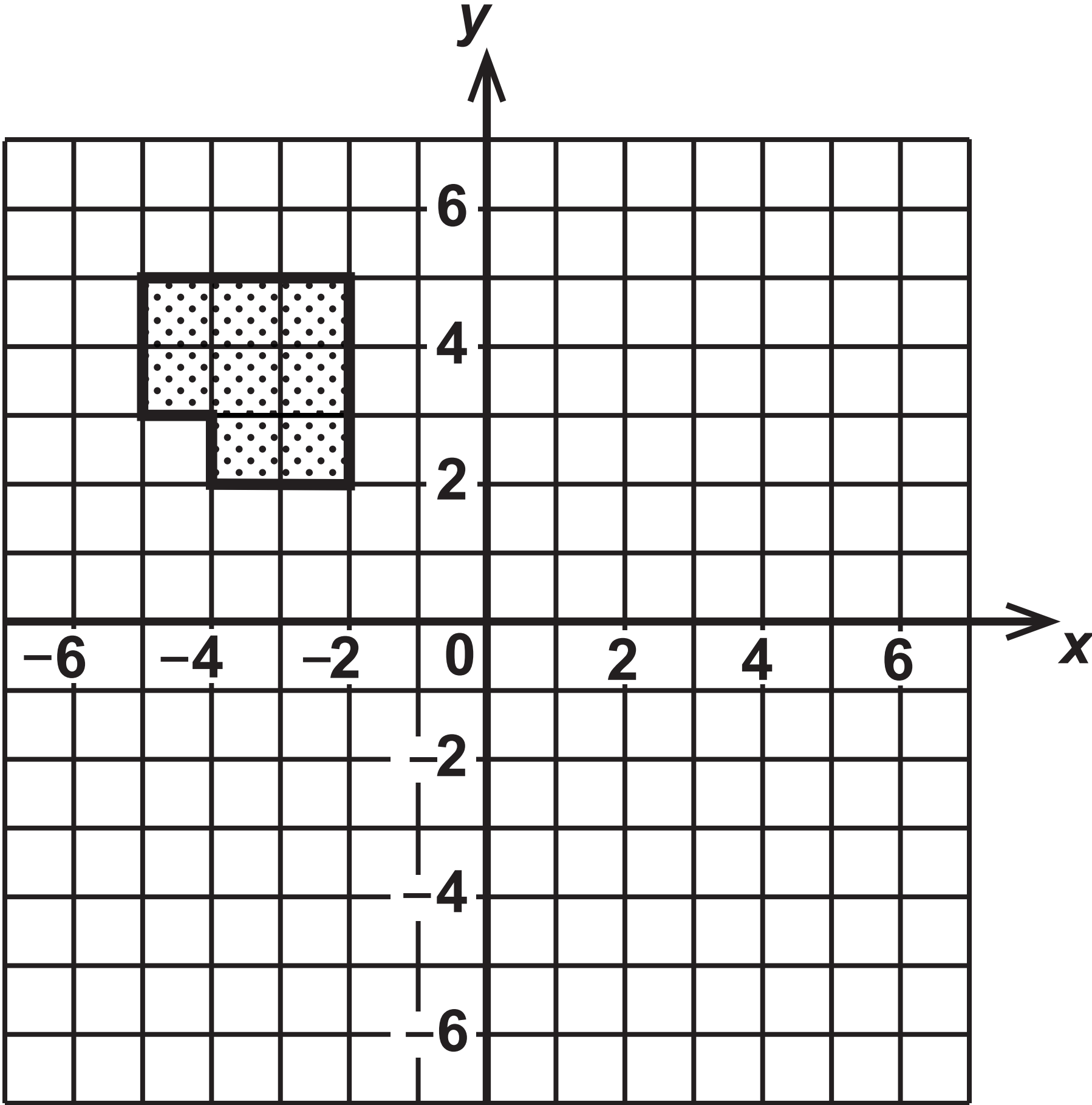
Triangular
spinner

	2	4	6	8
1		4		8
3	6		18	24
5		20		

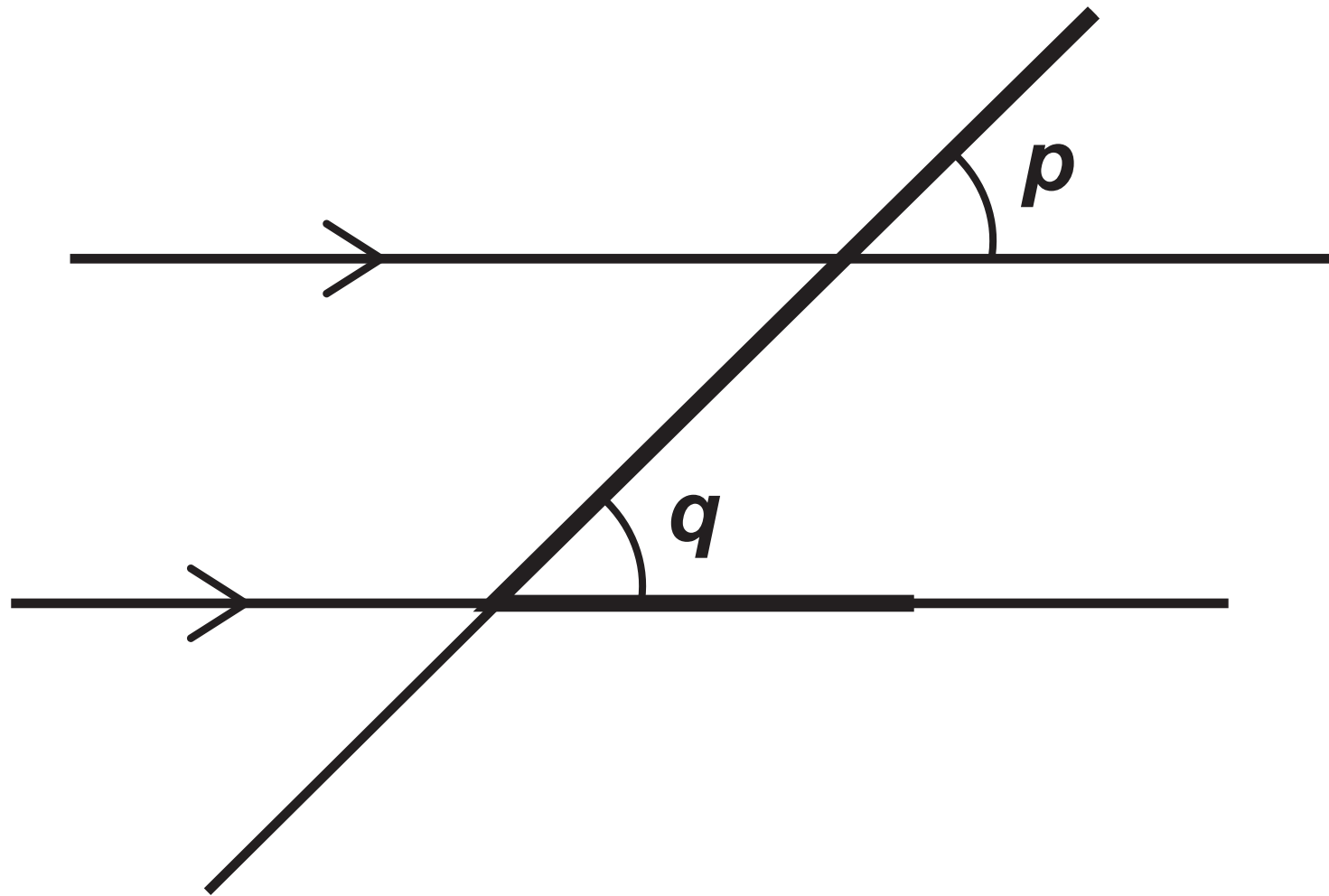
Question 6 (a)



Question 6 (b)

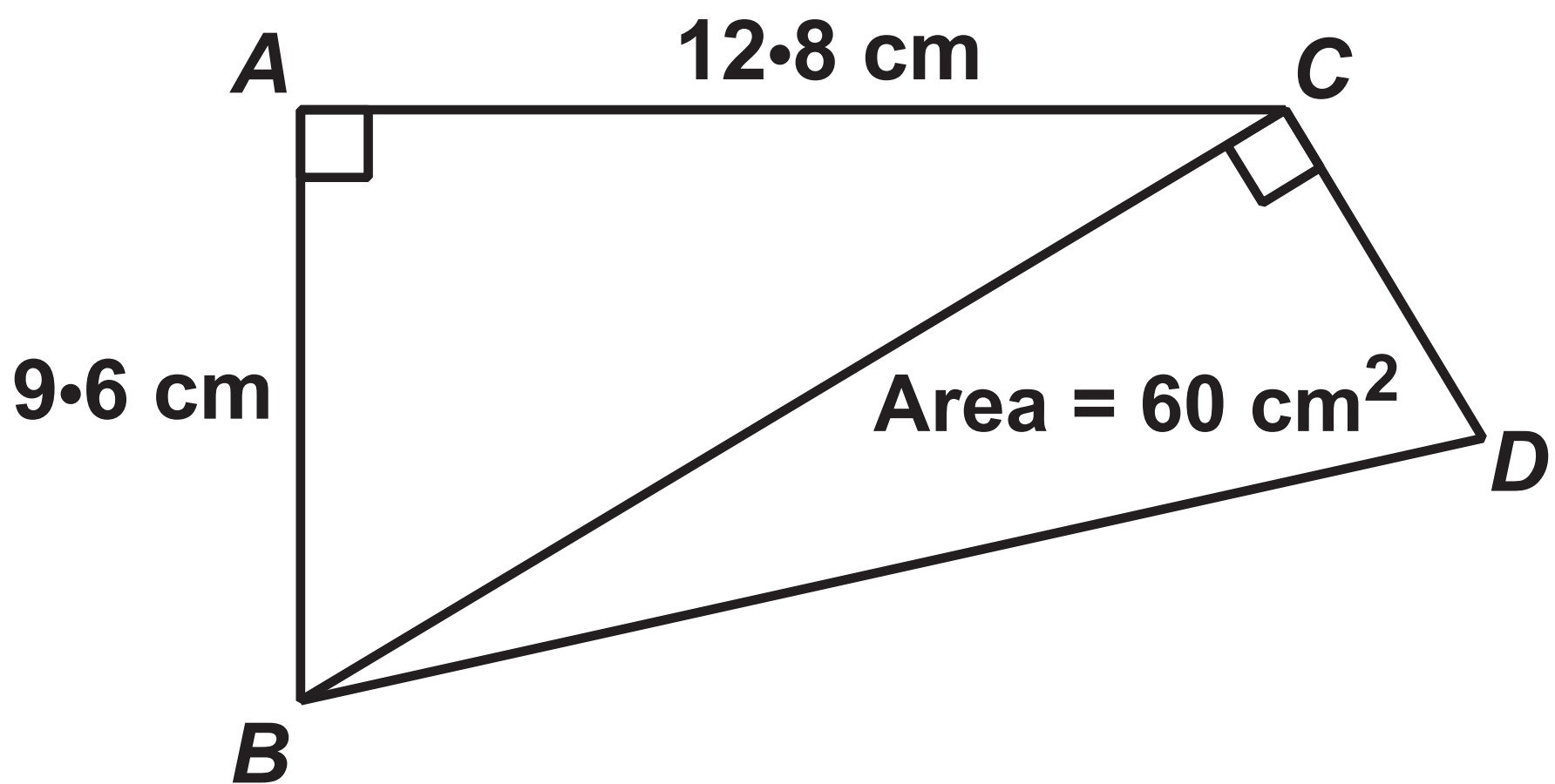


Question 8



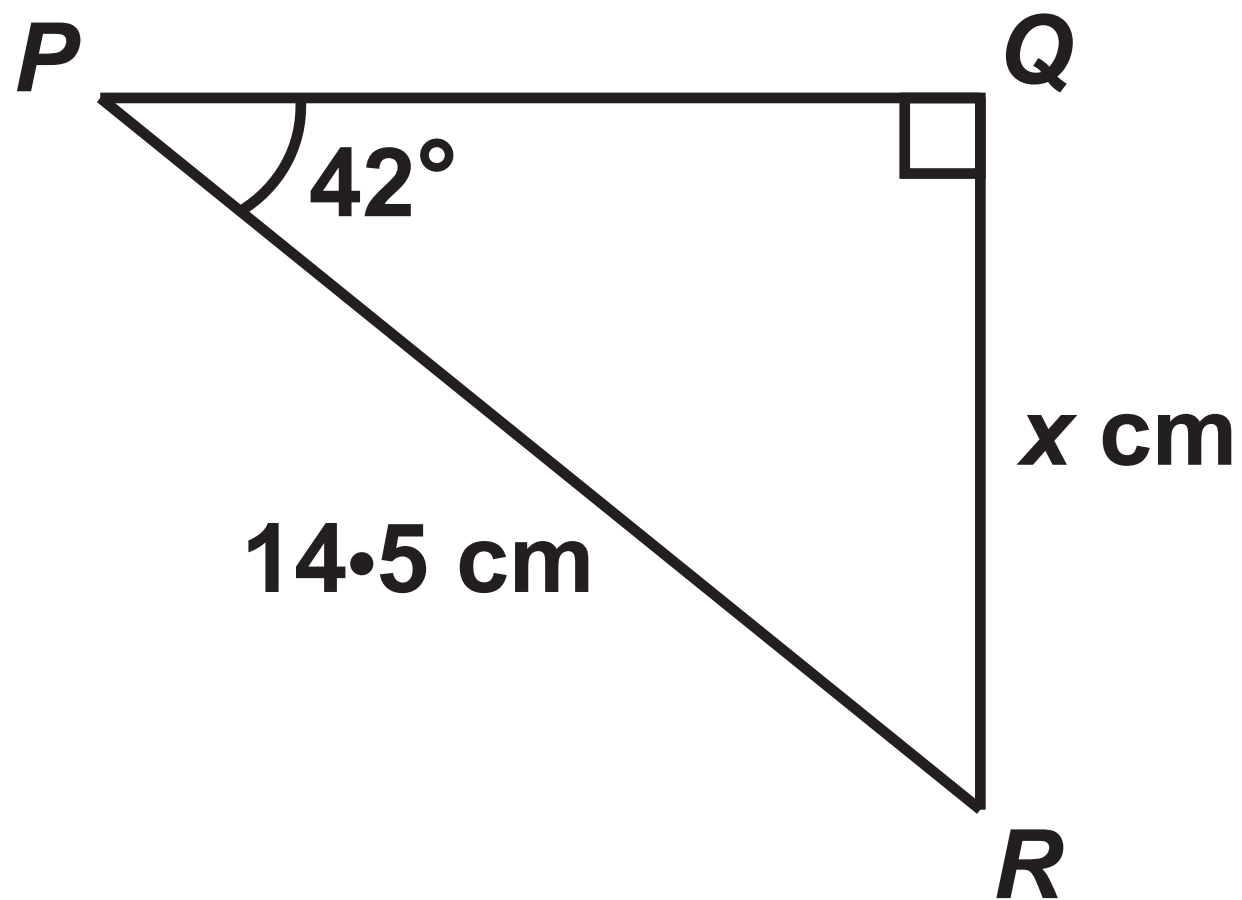
Question 11

Diagram NOT drawn to scale



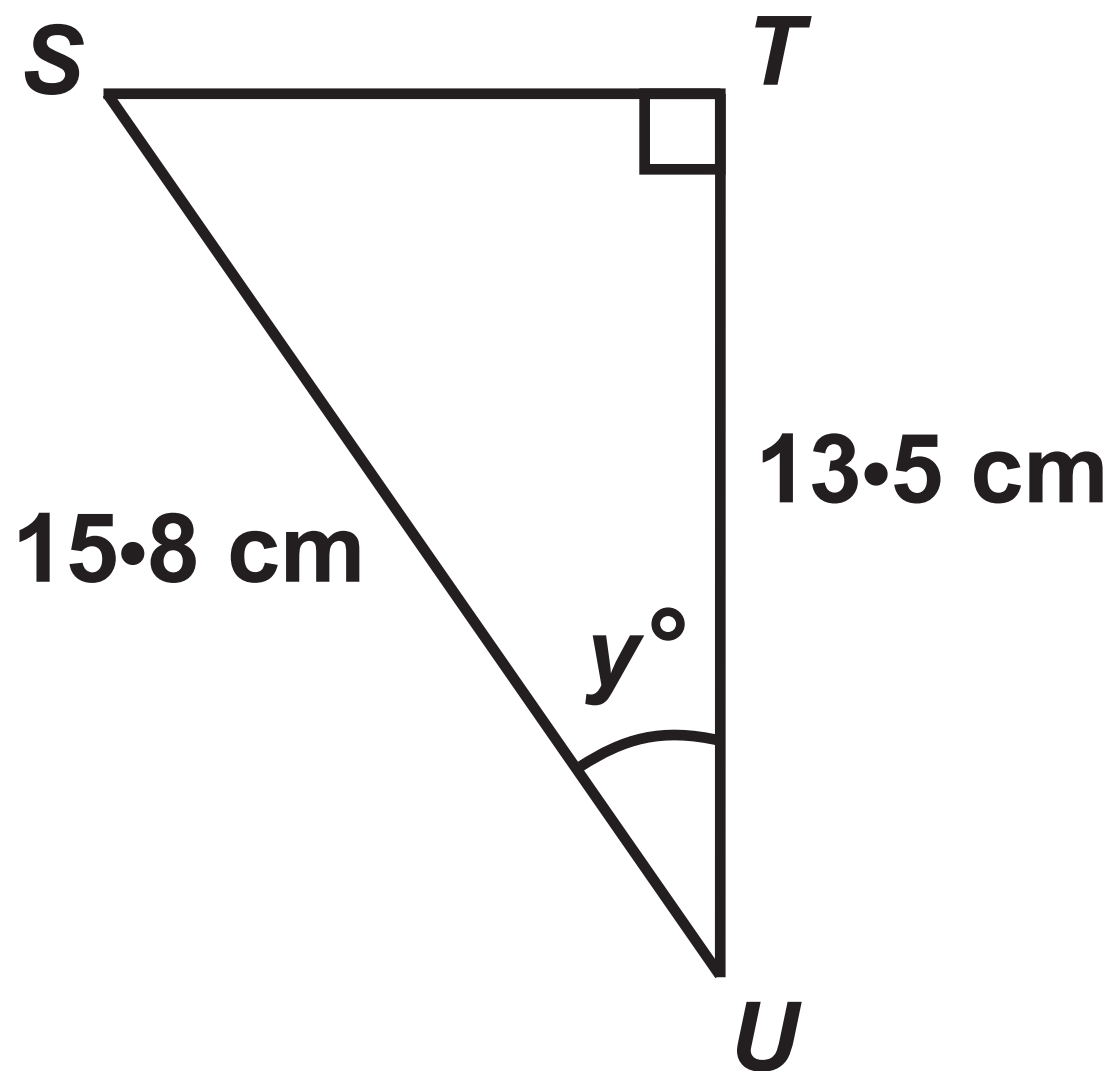
Question 13 (a)

Diagram NOT drawn to scale



Question 13 (b)

Diagram NOT drawn to scale



**GCSE
MATHEMATICS
and
NUMERACY**



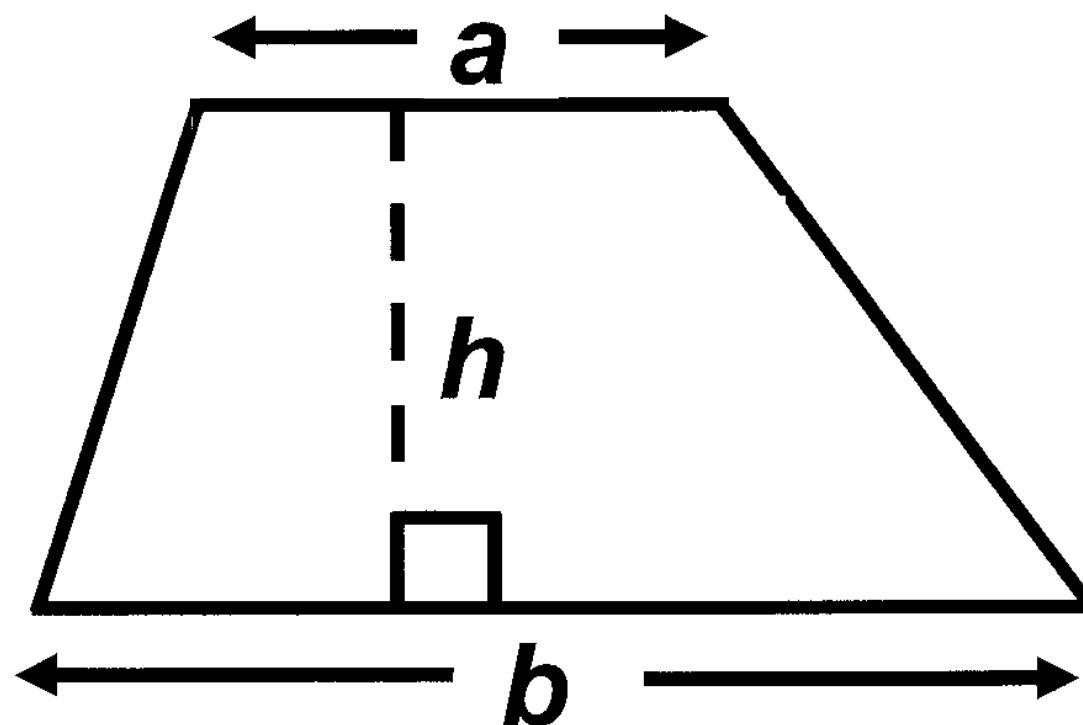
**FORMULA LIST
INTERMEDIATE TIER
GCSE**

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

