

3300U30-1

MONDAY, 11 NOVEMBER 2024 – MORNING

MATHEMATICS

UNIT 1: NON – CALCULATOR

INTERMEDIATE TIER

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

Diagram Booklet

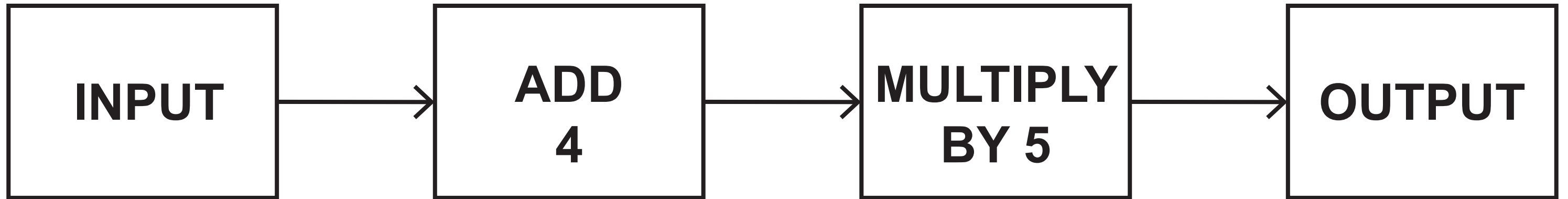
Surname: _____

First name(s): _____

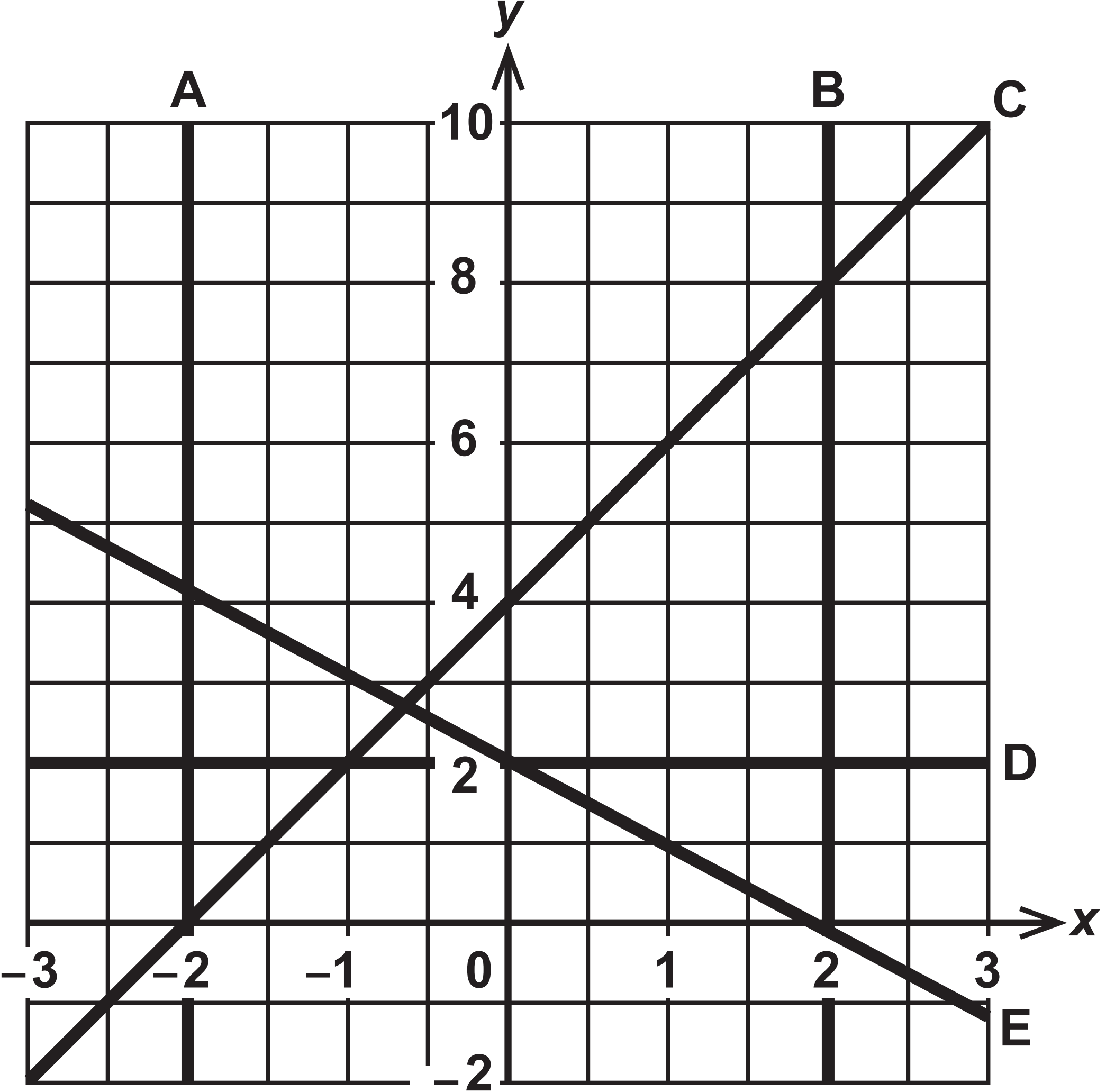
Centre Number: _____

Candidate Number: 0 _____

Question 1

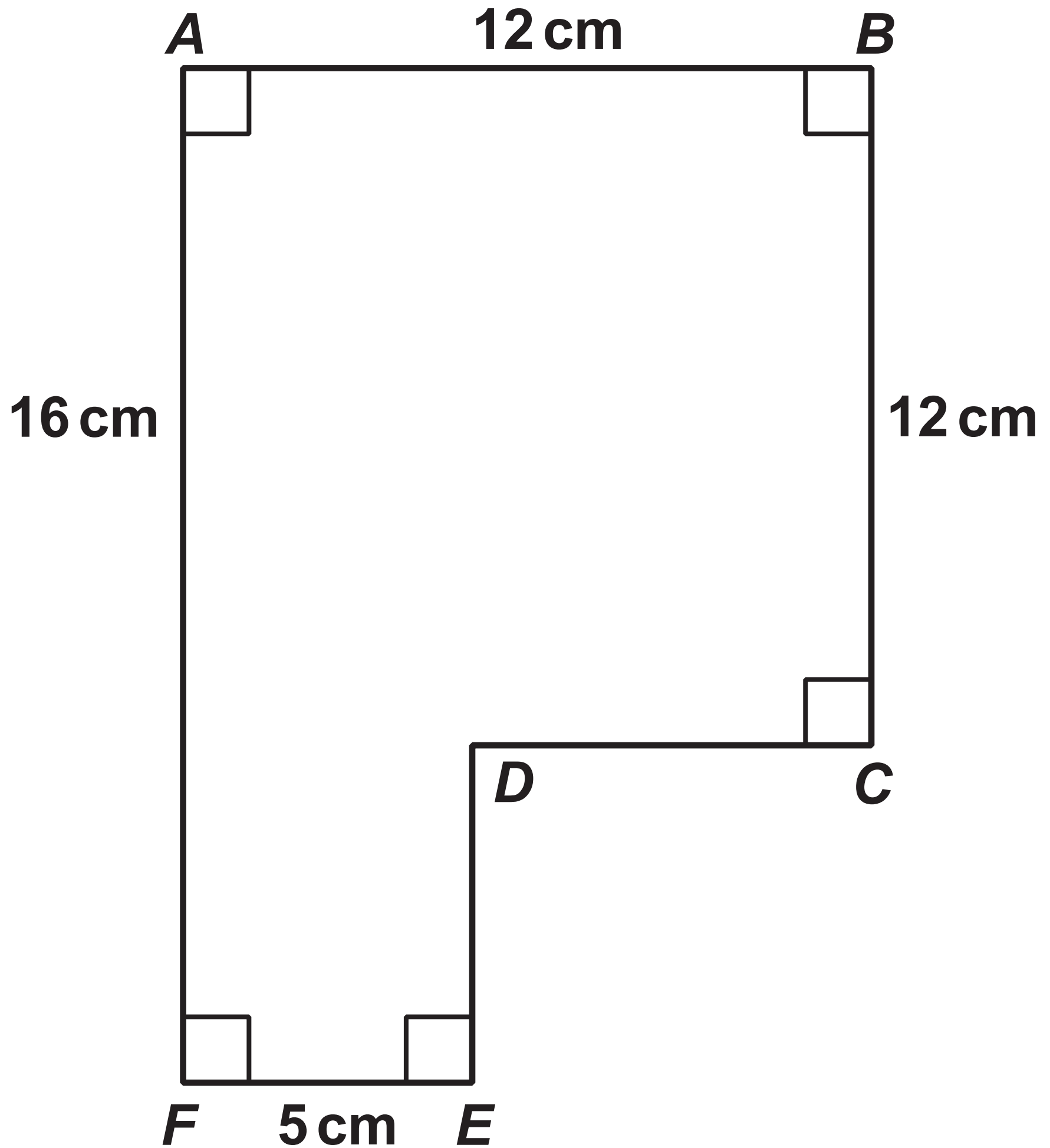


Question 3 (c)

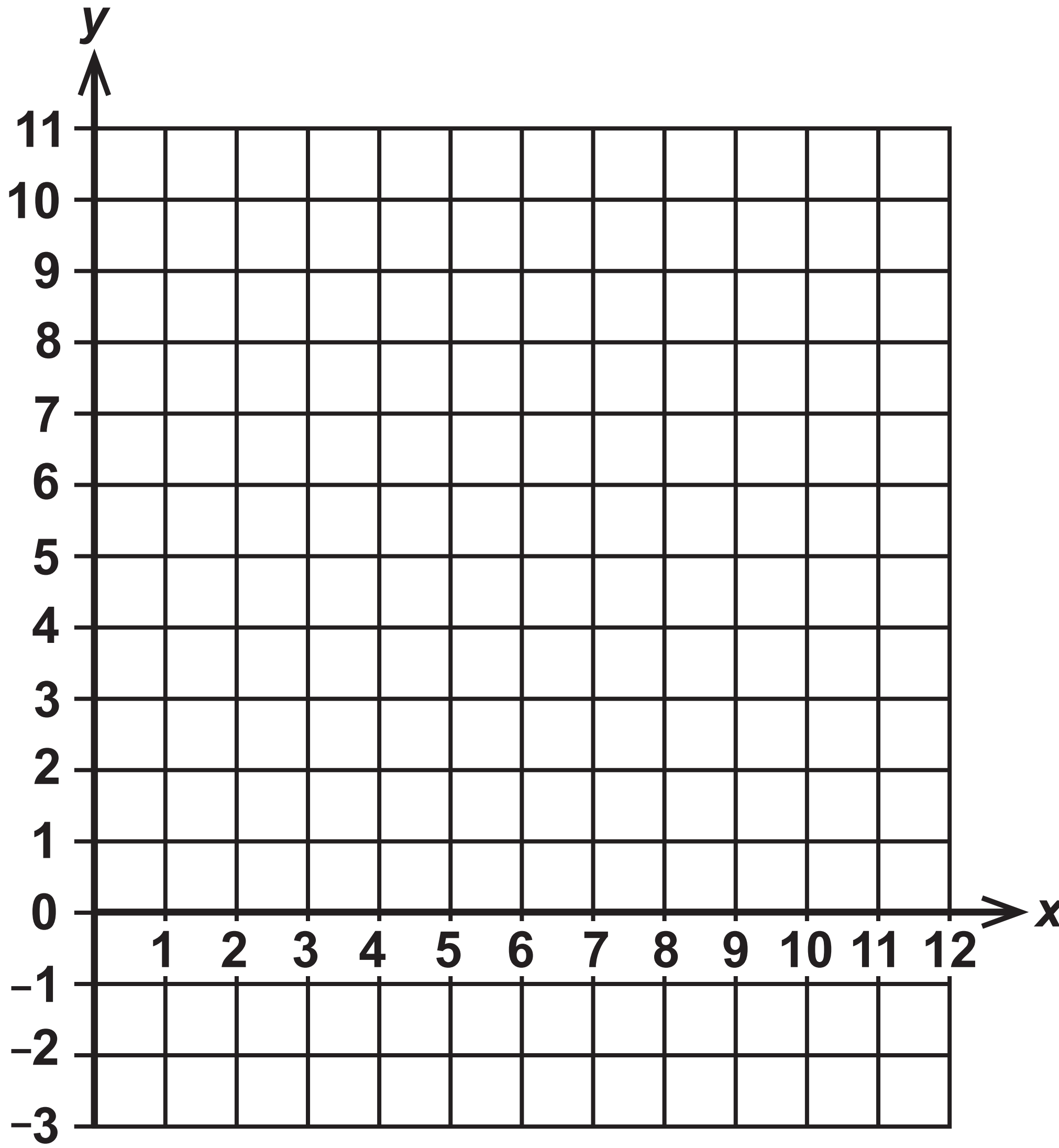


Question 5

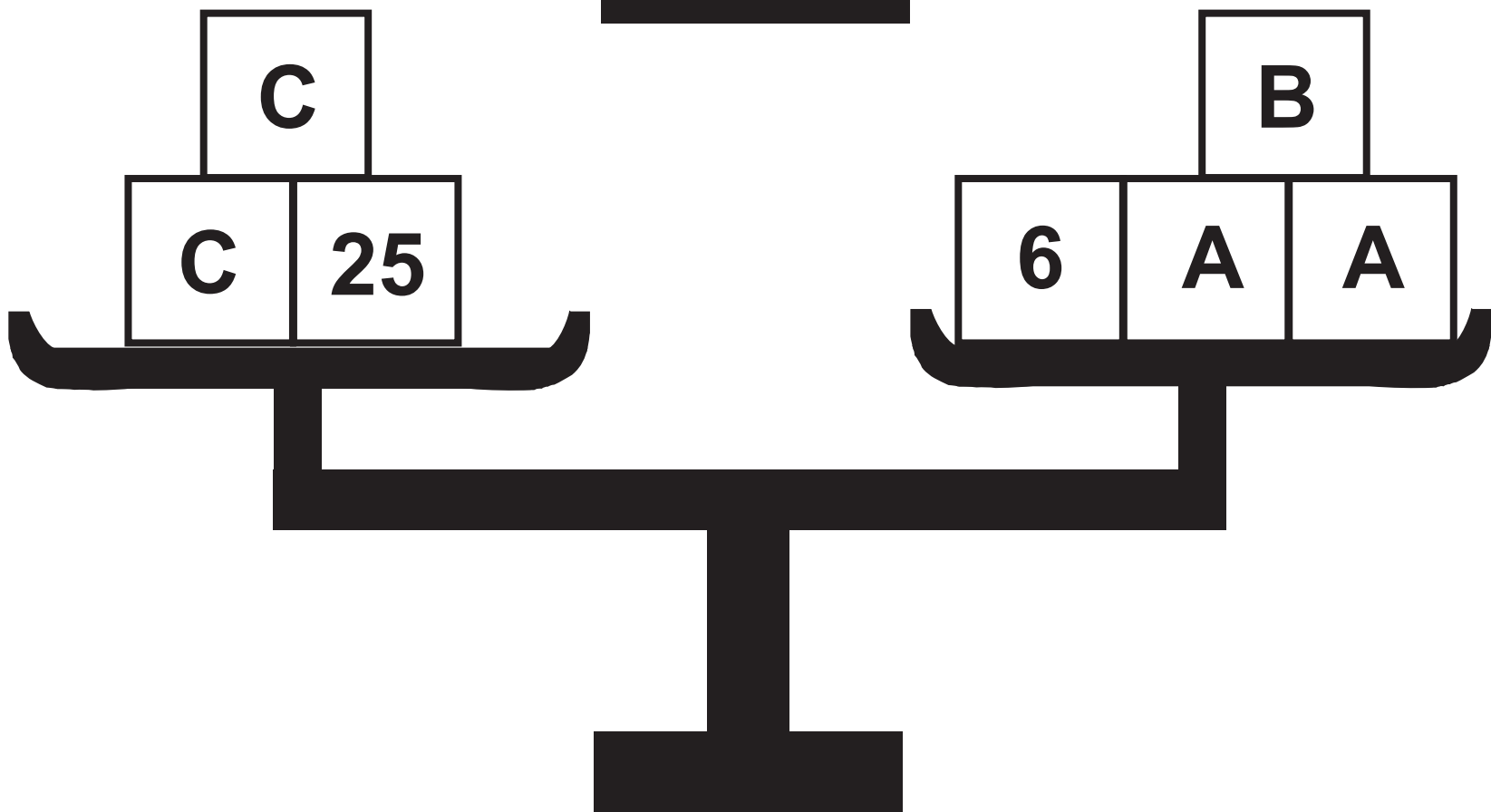
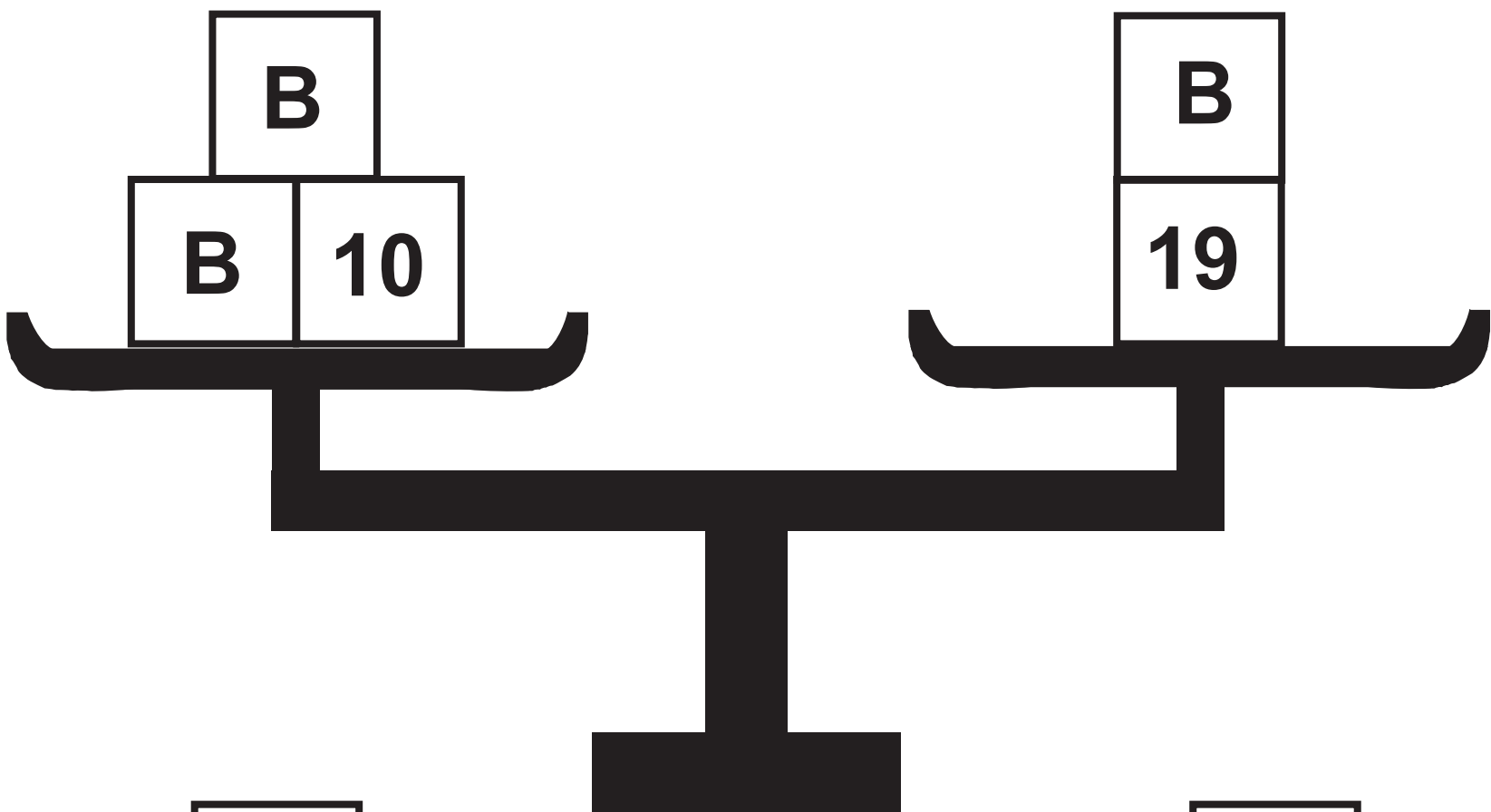
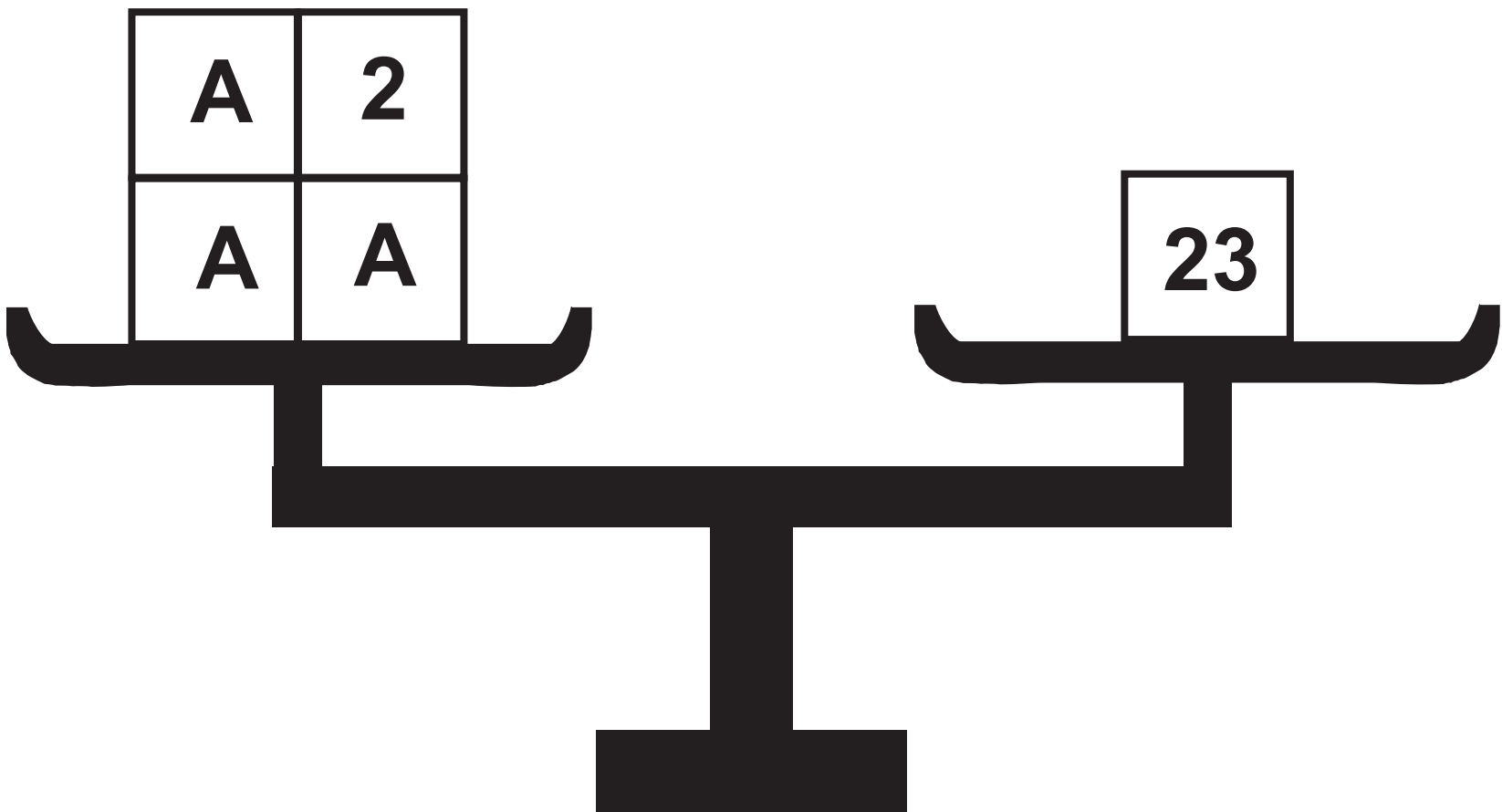
Diagram NOT drawn to scale



Question 6

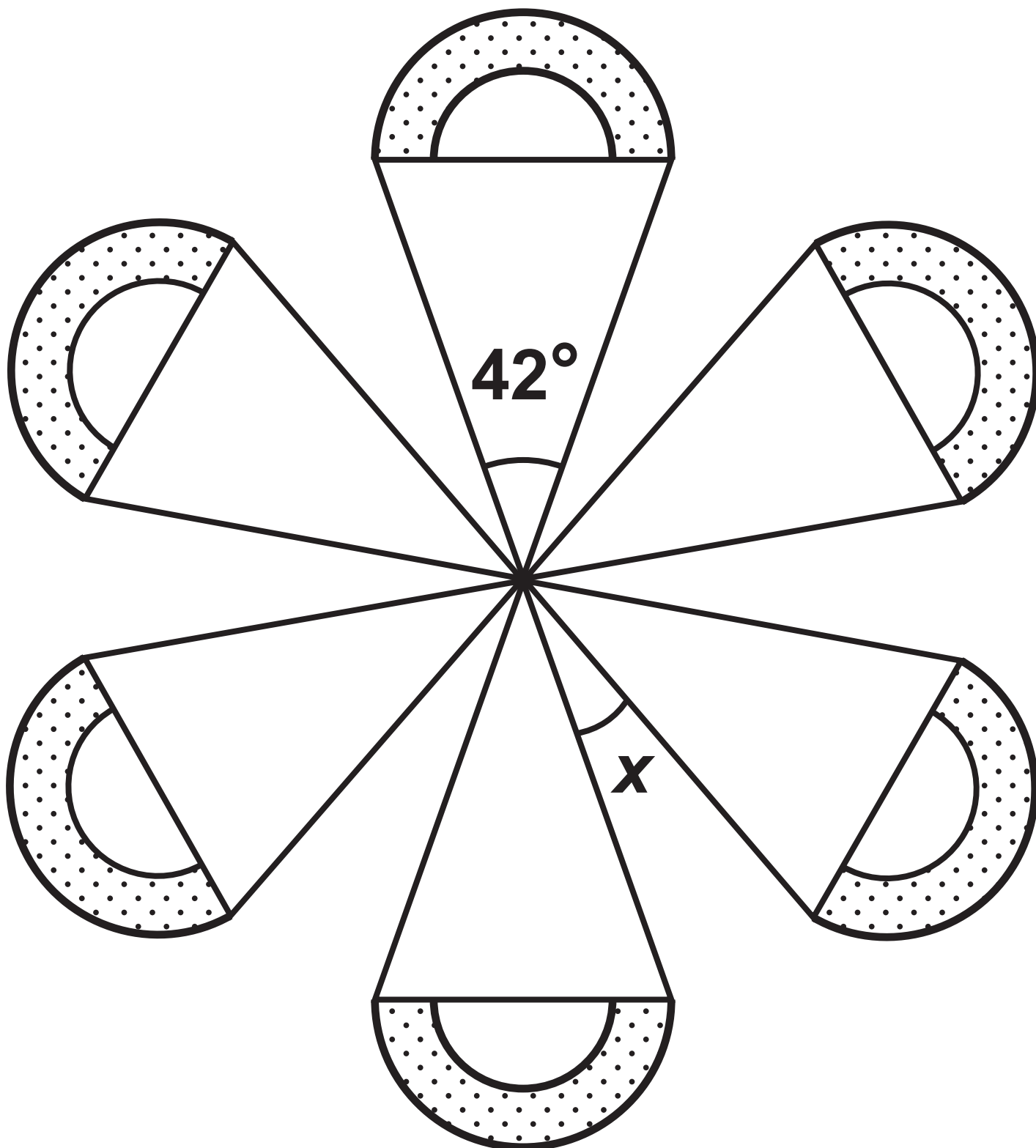


Question 7



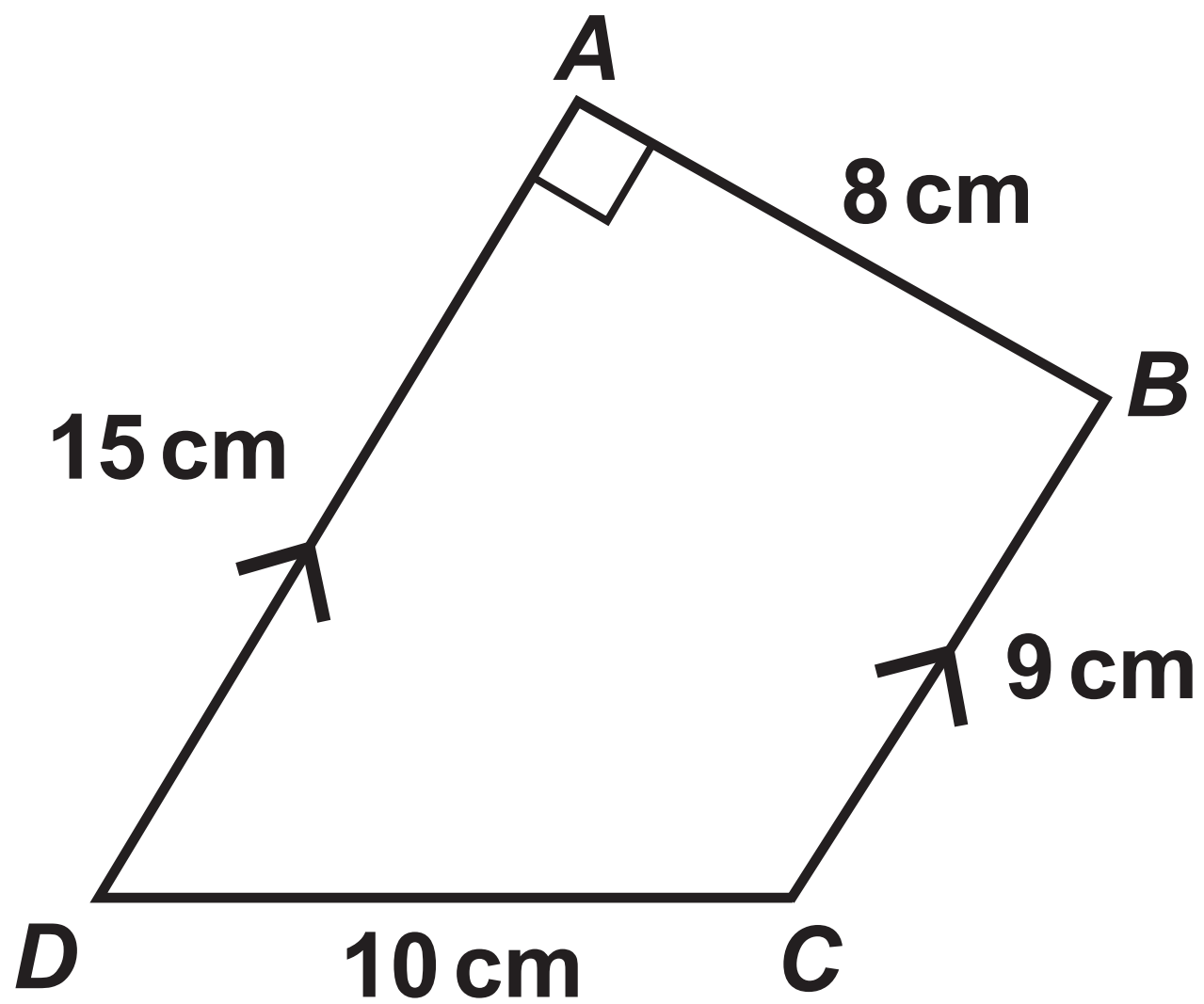
Question 8

Diagram NOT drawn to scale

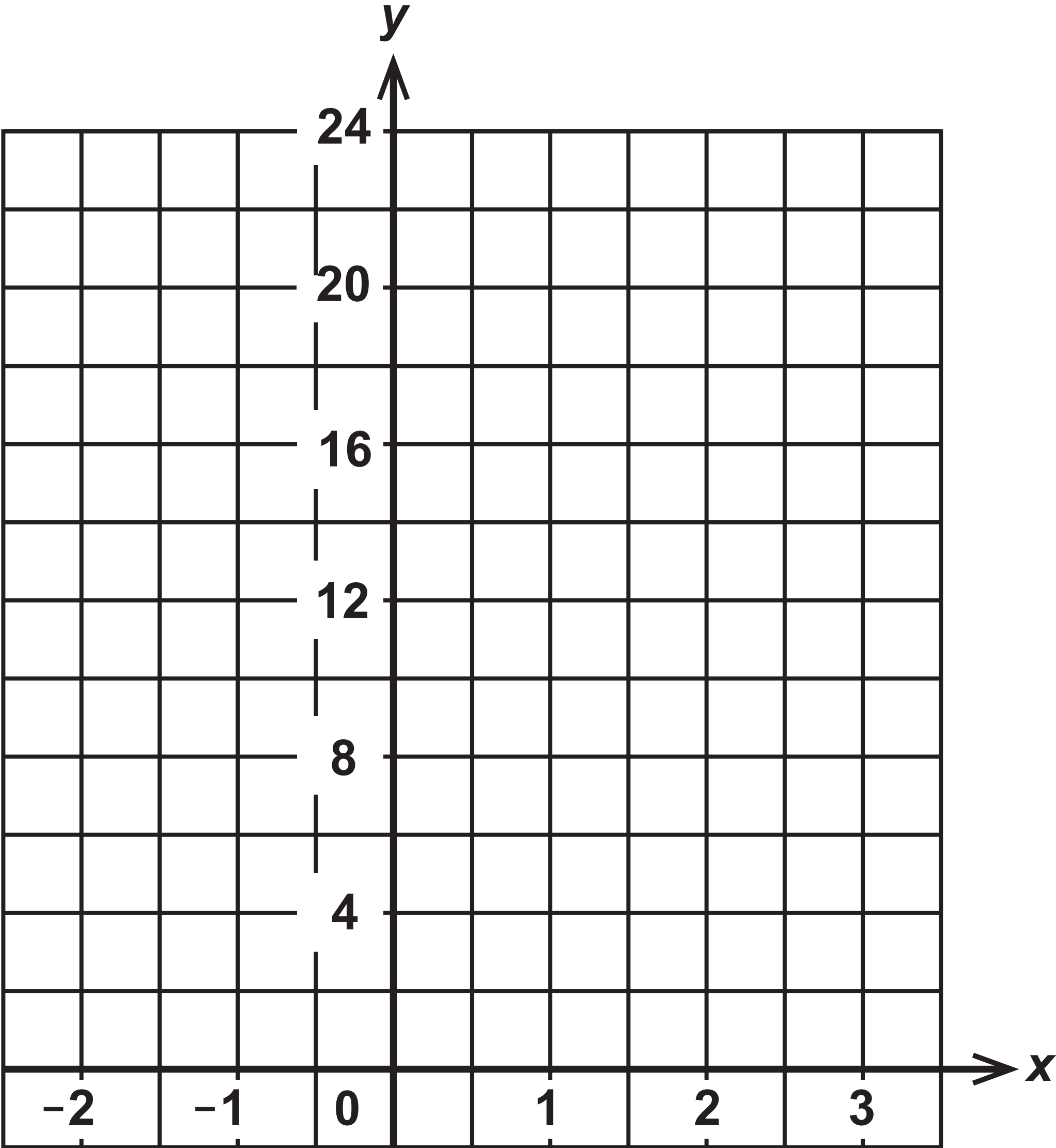


Question 9

Diagram NOT drawn to scale

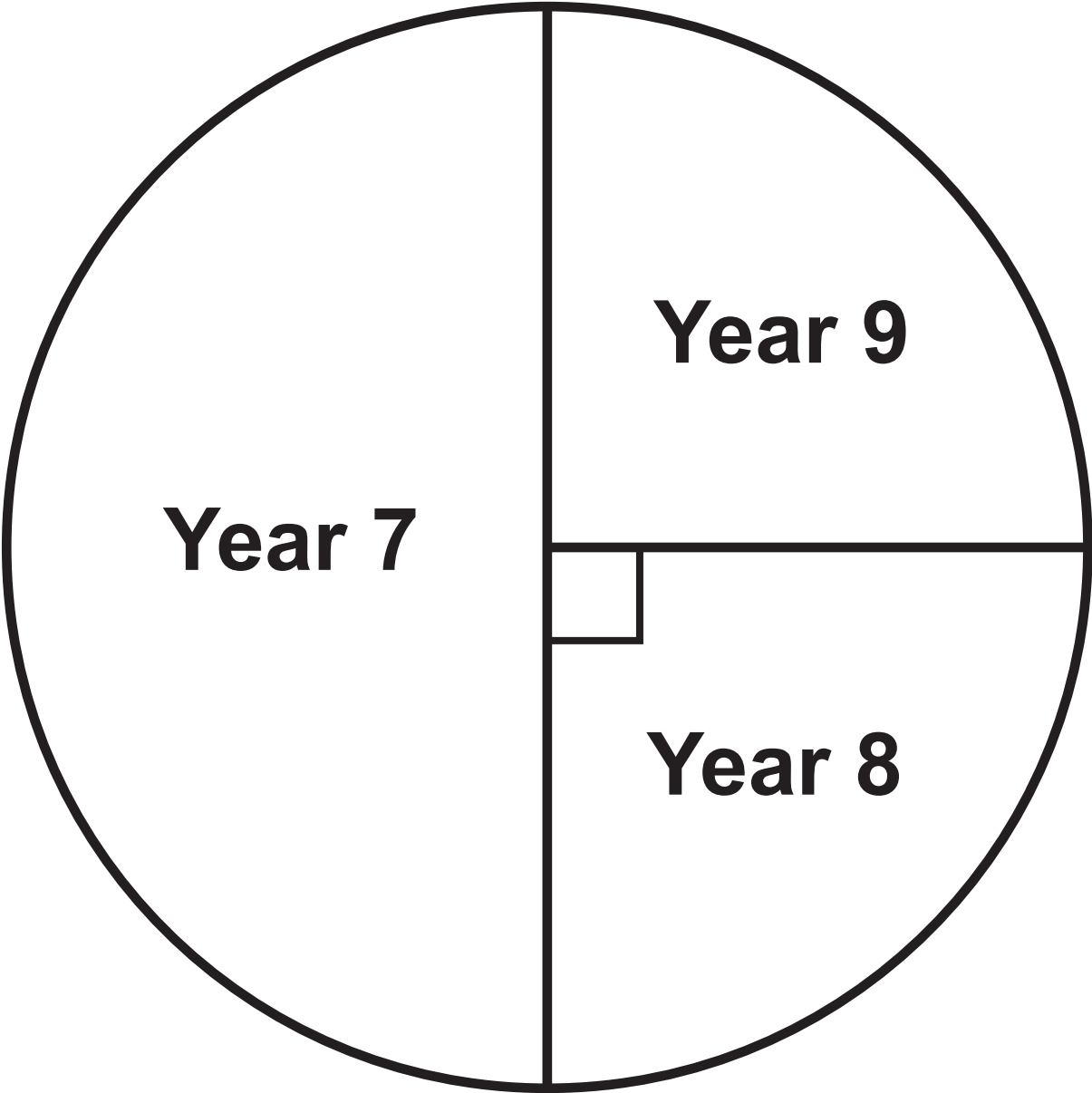


Question 11 (b)

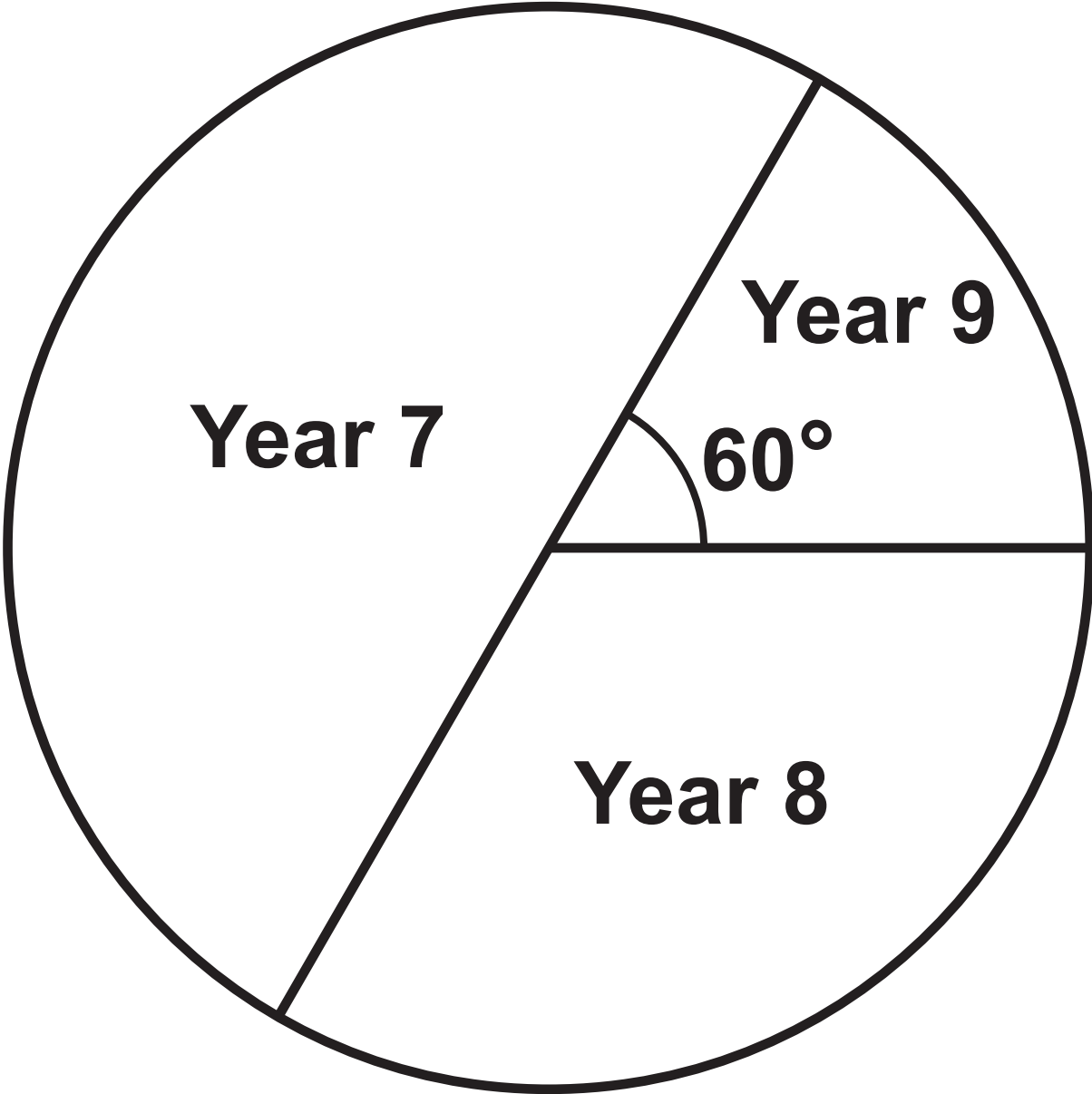


Question 12

YSGOL AFON



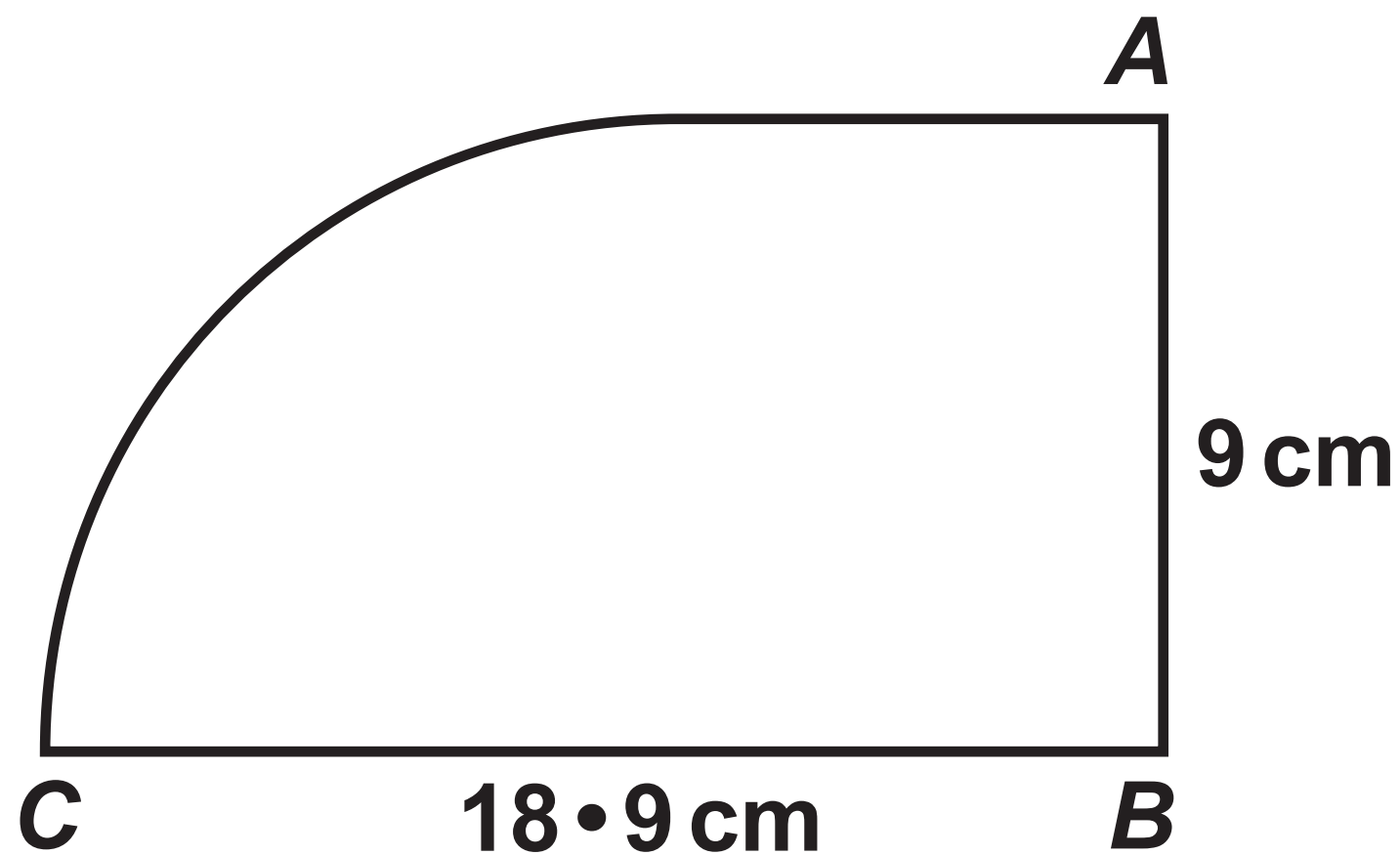
YSGOL TWYN



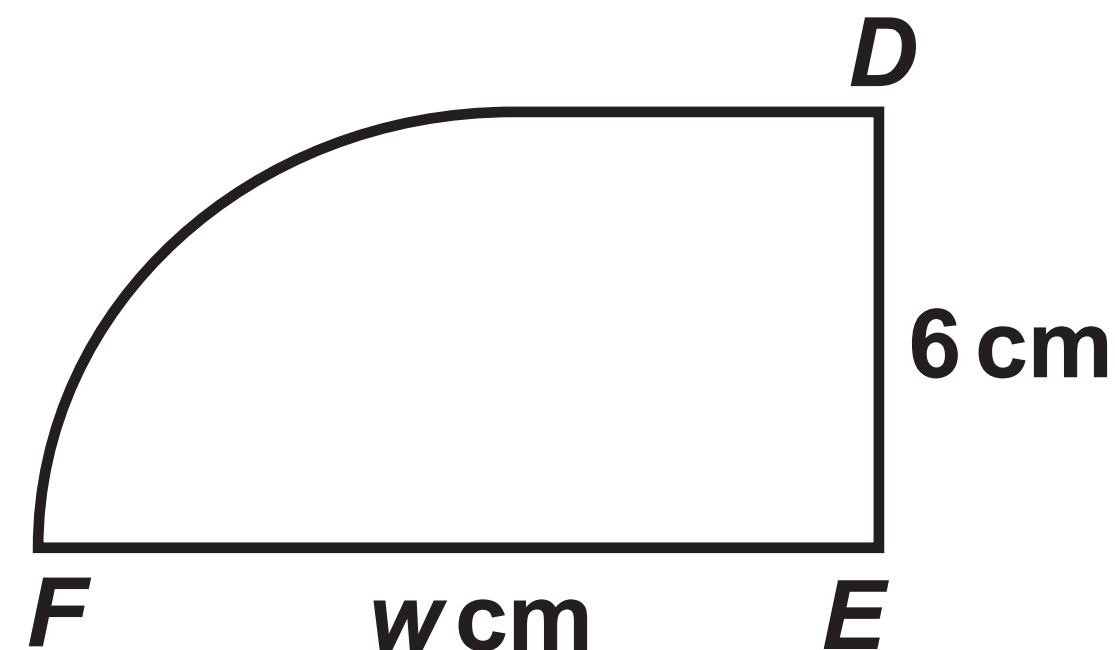
Question 14

Diagrams NOT drawn to scale

Shape 1



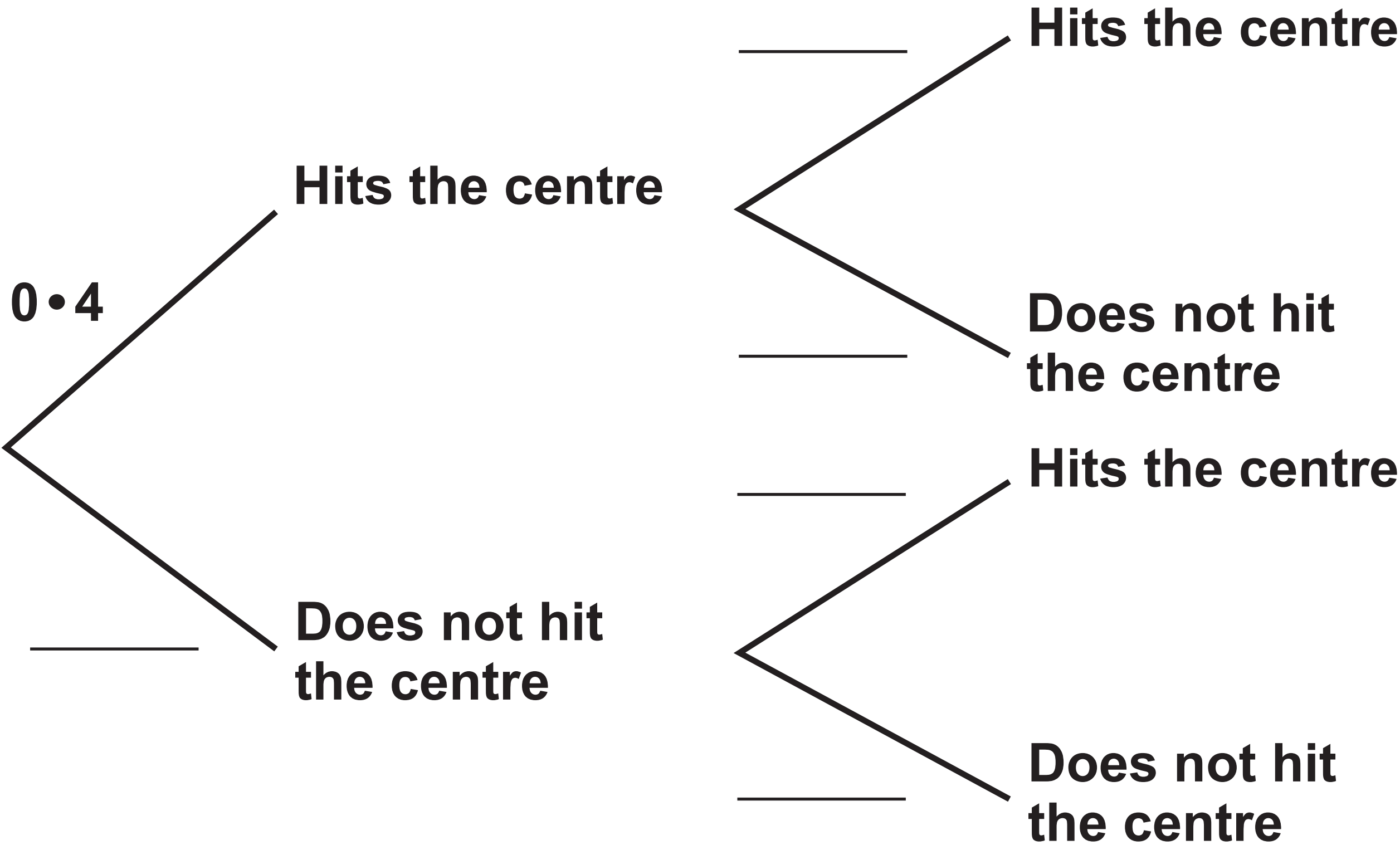
Shape 2



Question 15 (a)

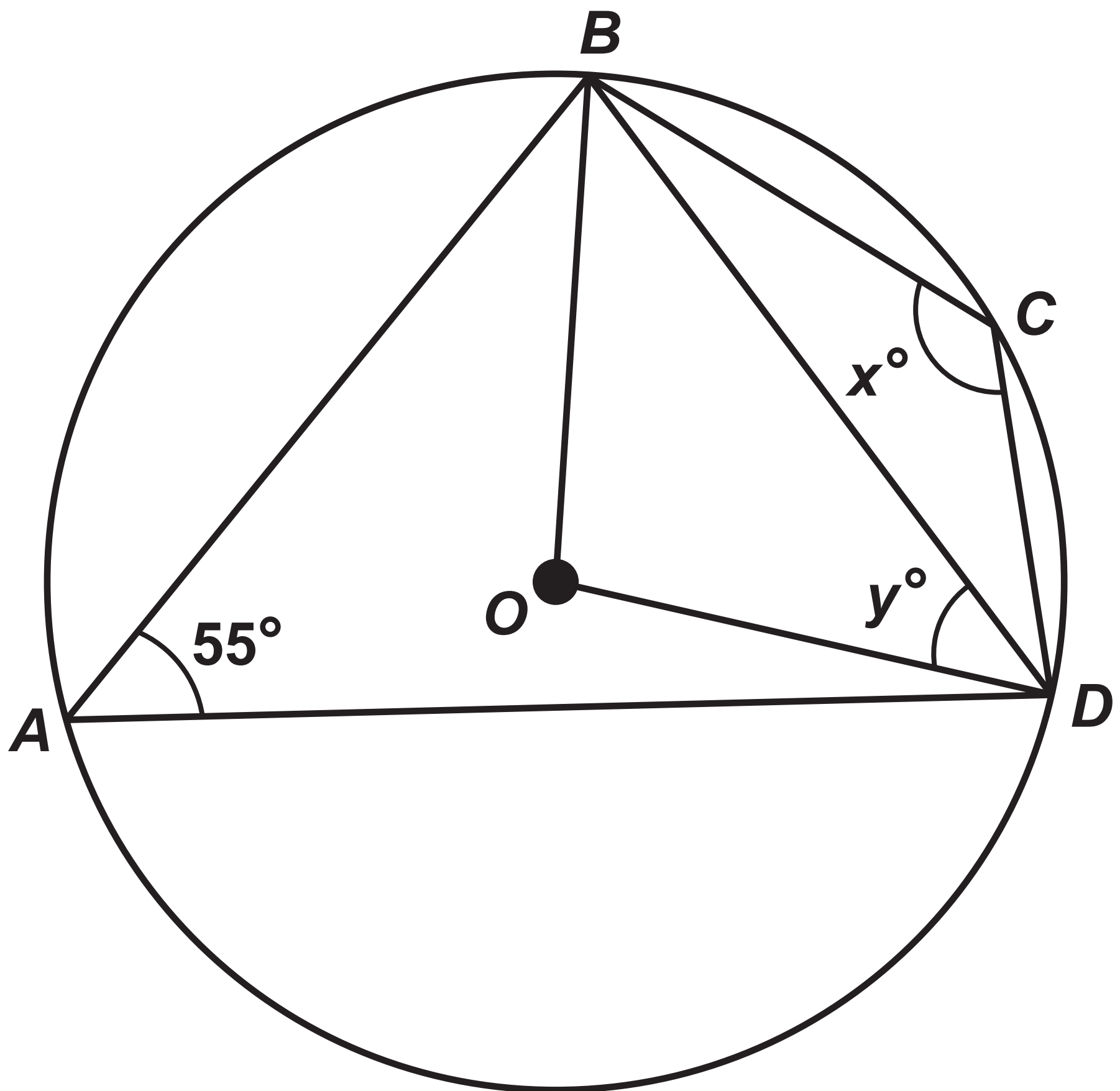
EVAN

JANE



Question 18

Diagram NOT drawn to scale





GCSE

3300U30–1

MONDAY, 11 NOVEMBER 2024 – 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.	5	
2.	2	
3.	6	
4.	5	
5.	6	
6.	4	
7.	6	
8.	4	
9.	3	
10.	3	
11.	4	
12.	5	
13.	6	
14.	2	
15.	5	
16.	7	
17.	3	
18.	4	
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 5.

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, taking care to number the question(s) correctly.

Take π as $3 \cdot 14$

(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 5, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

(Turn over)

1. Look at the diagram for Question 1 in the separate Diagram Booklet. The diagram shows a number machine.

Complete the table below.

INPUT	OUTPUT
-7	
	-100
$2 \cdot 5$	
n	

Space for working:

(Turn over)

6

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.

[5 marks]

(Turn over)

2. ESTIMATE the value of 33×7940

**You must show your approximations
in your working.**

[2 marks]

(Turn over)

3. (a) Simplify the expression

$$7s - 8t - 4s + 3t$$

[2 marks]

(b) Use the formula $F = 5T + 4R$
to find the VALUE OF R when
 $F = 23$ and $T = 3$

(Turn over)

[3 marks]

continued on the next page . . .

(Turn over)

Question 3 continued

- 3. (c) Look at the diagram for Question 3 (c) in the separate Diagram Booklet. The diagram shows a grid with five lines drawn on it, A, B, C, D and E. Which of the lines is represented by the equation $y = 2$? Circle your answer.**

Line A
Line B
Line C
Line D
Line E

[1 mark]

(Turn over)

- 4. Bethan has two brothers, Andrew and Richard.**

**Andrew is 7 years older than Bethan.
Richard is 3 years older than Andrew.**

- (a) Today, the sum of all their ages
is 59 years.**

**How old are Bethan, Andrew and
Richard today?**

(Turn over)

Bethan = _____ years old

Andrew = _____ years old

Richard = _____ years old

[2 marks]

continued on the next page . . .

(Turn over)

Question 4 continued

- 4. (b) (i) Write down the ratio of
Andrew's age to Richard's age
when Andrew is 27
Write the ratio in its
simplest form.**

Ratio of Andrew's age to Richard's age

= _____ : _____

[2 marks]

continued on the next page . . .

(Turn over)

Question 4 (b) continued

- 4. (b) (ii) Explain why the ratio of Andrew's age to Richard's age can never be 1 : 1**

[1 mark]

(Turn over)

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

Ask for the model for Question 5.

It is a model of a solid.

The model is NOT to scale.

The top surface of the solid is labelled *ABCDEF*.

The height of the solid is 2 cm.

Look at the diagram for Question 5 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The diagram shows the top surface of the solid and is labelled *ABCDEF*.

continued on the next page . . .

(Turn over)

Question 5 continued

In the diagram:

$$\mathbf{AB = 12\text{ cm}}$$

$$\mathbf{BC = 12\text{ cm}}$$

$$\mathbf{EF = 5\text{ cm}}$$

$$\mathbf{FA = 16\text{ cm}}$$

Angles ABC , BCD , DEF , EFA and FAB are right angles.

Find the volume of the solid.

You must show all your working.

(Turn over)

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(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)

[4 marks + 2 marks OCW]

- 6. Look at the diagram for Question 6 in the separate Diagram Booklet. The diagram shows a coordinate grid. Three of the four vertices of a parallelogram have the following coordinates.**

$(4, 3)$ $(5, -1)$ $(8, 3)$

Plot these points on the coordinate grid.

Then, plot ALL THREE possible points for the fourth vertex.

Write down the coordinates of these three points.

(Turn over)

The THREE possible points for the fourth vertex are

(_____ , _____)

(_____ , _____)

(_____ , _____)

[4 marks]

(Turn over)

- 7. Look at the diagrams for Question 7 in the separate Diagram Booklet. There are 3 diagrams. Each diagram represents a balance. For each balance, the total mass on the left – hand side is equal to the total mass on the right – hand side.**

Find the values of A, B and C.

(Turn over)

A = _____

B = _____

C = _____

[6 marks]

- 8. Look at the diagram for Question 8 in the separate Diagram Booklet. The diagram is NOT drawn to scale. The diagram shows a shape with rotational symmetry of order 6**

Find the size of angle x .

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)

[4 marks]

(Turn over)

9. Look at the diagram for Question 9 in the separate Diagram Booklet. The diagram is NOT drawn to scale. The diagram shows a trapezium labelled *ABCD*.

In the diagram:

$$AB = 8 \text{ cm}$$

$$BC = 9 \text{ cm}$$

$$CD = 10 \text{ cm}$$

$$DA = 15 \text{ cm}$$

AD is parallel to *BC*.

Angle *DAB* is a right angle.

continued on the next page . . .

(Turn over)

Question 9 continued

Calculate the area of the trapezium shown.

You must give the units of your answer.

(Turn over)

[3 marks]

10. Express 945 as a product of its prime factors in index form.

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)

[3 marks]

11. The table below shows some of the values of $y = 2x^2 + x + 3$ for values of x from -2 to 3

x	$y = 2x^2 + x + 3$
-2	
-1	4
0	3
1	6
2	
3	24

- (a) Complete the table by finding the values of y for $x = -2$ and for $x = 2$

[2 marks]

continued on the next page . . .

(Turn over)

Question 11 continued

- 11. (b) On the graph paper provided for Question 11 (b) in the separate Diagram Booklet, draw the graph of $y = 2x^2 + x + 3$ for values of x from -2 to 3**

[2 marks]

(Turn over)

- 12. Look at the diagrams for Question 12 in the separate Diagram Booklet. The diagrams are pie charts.**
- The pie charts show the distributions of Year 7, Year 8 and Year 9 pupils in two schools, Ysgol Afon and Ysgol Twyn.**
- There are 254 YEAR 7 pupils in Ysgol Afon.**
- The TOTAL number of pupils in Year 7, Year 8 and Year 9 in Ysgol Twyn is 480**

continued on the next page . . .

(Turn over)

Question 12 continued

One pupil is chosen at random from all the Year 7, Year 8 and Year 9 pupils in these two schools.

What is the probability that this pupil is in Year 9?

(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)

[5 marks]

- 13. A cyclist travels for 2 hours at an average speed of x miles per hour. She then travels for a further 3 hours at an average speed of $(x + 6)$ miles per hour. She travels a total distance of 78 miles.**

Form an equation, in terms of x , to represent the total distance she travels.

Solve your equation and use your solution to complete the statements below.

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.

First, the cyclist travels for 2 hours at an average speed of _____ miles per hour.

Then, she travels for a further 3 hours at an average speed of _____ miles per hour.

[6 marks]

(Turn over)

- 14. Look at the diagrams for Question 14 in the separate Diagram Booklet.**
The diagrams are NOT drawn to scale.
There are two diagrams: Shape 1 and Shape 2
The two shapes are mathematically similar.

In Shape 1:

$$**AB = 9 \text{ cm}**$$

$$**BC = 18 \cdot 9 \text{ cm}**$$

In Shape 2:

$$**DE = 6 \text{ cm}**$$

$$**EF = w \text{ cm}**$$

Calculate the value of w .

(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)

[2 marks]

(Turn over)

15. Evan and Jane each shoot one arrow at a target.

The probability that Evan hits the centre of the target is 0.4

The probability that Jane hits the centre of the target is 0.45

(a) Look at the diagram for Question 15 (a) in the separate Diagram Booklet. The diagram shows an incomplete tree diagram.

Complete the tree diagram.

[3 marks]

continued on the next page . . .

(Turn over)

Question 15 continued

- 15. (b) Find the probability that Evan and Jane both hit the centre of the target.**

(Turn over)

[2 marks]

(Turn over)

16. A rectangle has length $(x + 5)$ cm and width $(x + 3)$ cm.

The area of the rectangle is 120 cm^2

(a) Show that $x^2 + 8x - 105 = 0$

[2 marks]

continued on the next page . . .

(Turn over)

Question 16 continued

**16. (b) Factorise $x^2 + 8x - 105$ and
hence solve $x^2 + 8x - 105 = 0$**

[3 marks]

continued on the next page . . .

(Turn over)

Question 16 continued

16. (c) Use your solutions from part (b) to find the dimensions of the rectangle.

You must justify any decisions that you make.

(Turn over)

Length of rectangle = _____ cm

Width of rectangle = _____ cm

[2 marks]

**17. Convert 3.2×10^4 metres
into MILES.**

(Turn over)

3.2×10^4 metres is _____ miles
[3 marks]

(Turn over)

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

The diagram is NOT drawn to scale.

The diagram shows points A , B , C and D on the circumference of a circle with centre O .

(a) Calculate the value of x .

Circle your answer.

55°	70°	110°	125°	135°
------------------------------	------------------------------	-------------------------------	-------------------------------	-------------------------------

[1 mark]

continued on the next page . . .

(Turn over)

Question 18 continued

18. (b) Calculate the value of y .

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)

[3 marks]

END OF PAPER
TOTAL 80 MARKS

(Turn over)

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

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**GCSE
MATHEMATICS
and
GCSE
MATHEMATICS – NUMERACY**

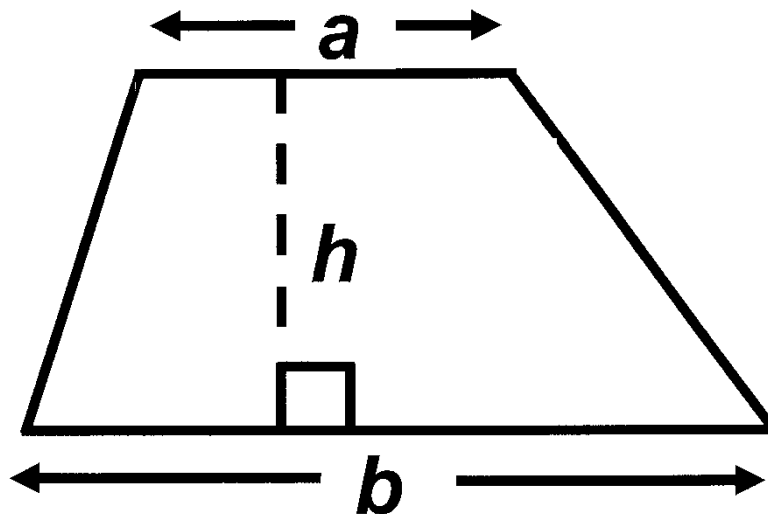
**FORMULA LIST
INTERMEDIATE TIER
GCSE**

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

