

GCSE – NEW

3300U30-1

MATHEMATICS

**UNIT 1: NON – CALCULATOR
INTERMEDIATE TIER**

TUESDAY,

13 JUNE 2017 – MORNING

1 hour 45 minutes

**(plus your additional
time allowance)**

**THE USE OF A
CALCULATOR IS NOT
PERMITTED IN THIS
EXAMINATION**

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	6	
2.	3	
3.	4	
4.	3	
5.	2	
6.	4	
7.	6	
8.	5	
9.	7	
10.	6	
11.	5	
12.	4	
13.	3	
14.	3	
15.	3	
16.	5	
17.	4	
18.	2	
19.	5	
Total	80	

Surname:	
Other Names:	
Centre Number:	
Candidate Number:	0

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.

A spare Diagram Booklet.

Cut out shapes for Question 3 (a) and Question 3 (c).

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 continuation pages at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3.14

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

1. (a) Write down the next two numbers in the following sequence.

35, 25, 16, 8, _____, _____

[2 marks]

- (b) Find the value of $2x + 7y$
when $x = -3$ and $y = 10$

[2 marks]

(Turn over)

Question 1 continued

1. (c) Simplify the expression

$$8k + 3m - 2k - 8m$$

[2 marks]

(Turn over)

2. Write down 0.4 , 15% and $\frac{7}{20}$
in ascending order.

You must show all your working.

_____ _____ _____
Smallest value $\longrightarrow$ Greatest value
[3 marks]

(Turn over)

- 3. (a) Look at the diagram for Question 3 (a) in the separate Diagram Booklet.**

The diagram shows a triangle on a coordinate grid.

Reflect the triangle shown in the X – axis.

A cut out triangle is provided for this question.

[1 mark]

- (b) Look at the diagram for Question 3 (b) in the separate Diagram Booklet.**

The diagram shows a triangle on a grid.

Enlarge the triangle shown by a scale factor of 3

[2 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 triangle on a coordinate grid.

Translate the triangle shown
3 squares to the left and 2 squares down.

A cut out triangle is provided for this question.

[1 mark]

4. (a) A fair, six – sided dice is rolled.

What is the probability that a 4 is shown on the dice?

Circle your answer.

6%	$\frac{1}{5}$	$\frac{1}{4}$	6:1	$\frac{1}{6}$
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[1 mark]

- (b) 50 raffle tickets were sold at a charity event.

Sian has a 20% chance of winning the top prize.

How many tickets did Sian buy?

Circle your answer.

1	2	4	10	20
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[1 mark]

(Turn over)

Question 4 continued

4. (c) Look at the information for Question 4 (c) in the separate Diagram Booklet.

A bag contains a mixture of blue beads, yellow beads and pink beads.

One bead is taken at random from the bag.

The probability that the bead is pink is $\frac{1}{5}$

Which of the sets of beads shown could have been in the bag?

Circle your answer.

[1 mark]

(Turn over)

5. Team A and Team B play in a competition.

Team A has nine more points than Team B.

Team A has four times as many points
as Team B.

How many points does each team have?

Team A: _____ points

Team B: _____ points

[2 marks]

(Turn over)

6. David, Jane and Mary are beach inspectors. Three beaches, Harlech, Rhyl and Porthcawl, are all to be inspected on a certain day.

It is decided to share the work so that the inspectors will visit one beach each, chosen at random.

- (a) In the space provided for Question 6 in the separate Diagram Booklet, list all the possible different ways they could share the work.

One has been done for you.

[2 marks]

Question 6 continued

- 6. (b) What is the probability that one of the female inspectors will visit Rhyl?**

[2 marks]

(Turn over)

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

The diagram is NOT drawn to scale.

The diagram shows a quadrilateral ***ABCD***.

In the quadrilateral,

Angle ***DCB*** = x°

Angle ***CDA*** = $3x^\circ$

Angle ***DAB*** = $2x^\circ$

Angle ***CBA*** is a right angle.

- (a) Calculate the value of ***X***.

(Turn over)

[4 marks]

7. (b) When $ABCD$ is drawn to scale, would the lines AD and BC be parallel or not? You must justify your answer without using a scale drawing.

[2 marks]

(Turn over)

8. (a) Estimate the value of $\frac{41.3 \times 29.6}{198.7}$

You must show all your working.

[2 marks]

continued on the next page . . .

(Turn over)

Question 8 continued

8. (b) Given that $54 \times 84.2 = 4546.8$
write down the exact value of each
of the following.

(i) 540×842

= _____
[1 mark]

(ii)
$$\frac{4546.8}{5.4}$$

= _____
[1 mark]

(iii)
$$\frac{454.68}{84.2}$$

= _____
[1 mark]

(Turn over)

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

Look at the diagram for Question 9 in the separate Diagram Booklet.
The diagram is NOT drawn to scale.

In the diagram,

$ABCD$ is a rectangle

PQ is parallel to AD

$DQ = g$ cm

$QC = 8$ cm

$CB = f$ cm

The area of $ABCD$ is 52 cm^2

The area of $APQD$ is 20 cm^2

Calculate the values of f and g .

You must show all your working.

[5 marks + 2 marks OCW]

(Turn over)

10. Ceri has a set of cards.

Each of her cards is labelled

North, East, South or West.

**(a) Look at the table for Question 10 (a)
in the separate Diagram Booklet.**

**Ceri chooses one card at random
from her set of cards.**

**Complete the table shown to find the
probability of Ceri choosing a card
labelled West.**

[2 marks]

continued on the next page . . .

(Turn over)

Question 10 continued

- 10. (b) Ceri chooses one card at random from her set of cards.**

What is the probability that the card is labelled East or South?

[2 marks]

- (c) Sasha has an identical set of cards.
Ceri and Sasha each choose one card at random from their set of cards.**

What is the probability that they both choose a card labelled North?

[2 marks]

(Turn over)

11. The table below shows some of the values of $y = x^2 - 5x + 2$ for values of x from -1 to 5

x	$y = x^2 - 5x + 2$
-1	8
0	2
1	-2
2	-4
3	
4	-2
5	2

- (a) Complete the table above.

[1 mark]

(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 $y = x^2 - 5x + 2$ for values of x from -1 to 5

[2 marks]

- (c) Draw the line $y = -3$ on the graph paper.

Write down the values of x where the line $y = -3$ cuts the curve $y = x^2 - 5x + 2$

Give your answers correct to 1 decimal place.

Values of x are _____ and _____

[2 marks]

(Turn over)

12. (a) Express 700 as a product of its prime factors in index form.

[illegible]

[3 marks]

(Turn over)

Question 12 continued

12. (b) The number **33 554 432** is equal to 2^{25}

Explain how this tells you that

33 554 432 is not a square number.

[1 mark]

(Turn over)

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

The diagram is a graph.

Which ONE of the following equations could represent the line shown in the graph?

Circle your answer.

$y = -x - 2$
$y = -x + 2$
$y = x + 2$
$y = x - 2$
$y = -x$

[1 mark]

continued on the next page . . .

(Turn over)

Question 13 continued

13. (b) Which ONE of the following points lies on the line $2y = 3x + 4$?

Circle your answer.

$(2, -5)$	$(5, 2)$	$(-2, 5)$	$(2, 5)$	$(-2, -5)$
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[1 mark]

continued on the next page . . .

(Turn over)

Question 13 continued

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

The diagram is a graph.

What is the gradient of the line shown in the graph?

Circle your answer.

$\frac{3}{2}$	$-\frac{3}{2}$	$\frac{2}{3}$	$-\frac{2}{3}$	-6
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[1 mark]

14. A WHOLE number is written on a card.

**You are given three clues to help you
work out the number on the card.**

**Clue 1: DOUBLE the number is between
8 and 18 inclusive.**

Clue 2: The number is a prime number.

Clue 3: The number is NOT a factor of 100

What is the number on the card?

You must show all your working.

(Turn over)

31

The number on the card is _____

[3 marks]

(Turn over)

- 15. Look at the table provided for Question 15 in the separate Diagram Booklet. The table shows six formulae.**

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

Consider the dimensions implied by the formulae.

Write down, for each case, 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]

16. A group of 20 people visited Anglesey for a weekend break.

- **10 of the group visited Beaumaris Castle.**
- **13 of the group visited South Stack Lighthouse.**
- **4 of the group did not visit either of these places.**

(a) Look at the diagram for Question 16 (a) in the separate Diagram Booklet.
The diagram is a Venn diagram.

Complete the Venn diagram to show the information given above.

The universal set, $\mathcal{U}$, contains all of the 20 people in the group.

(Turn over)

[3 marks]

16. (b) One person is chosen at random from the group.
What is the probability that this person visited only one of the two places?

[2 marks]

(Turn over)

- 17. Solve the following simultaneous equations using an algebraic (not graphical) method.**

$$3x + 4y = 7$$

$$2x - 3y = 16$$

[4 marks]

[illegible]

(Turn over)

(Turn over)

18. Calculate the value of

$$(5.41 \times 10^5) + (2.3 \times 10^4)$$

Give your answer in standard form.

[2 marks]

(Turn over)

19. Rashid owned n sheep.

Eifion had exactly 4 times as many sheep as Rashid.

Rashid buys 17 extra sheep.

Eifion sells 8 of his sheep.

Eifion still has more sheep than Rashid.

Form an inequality, in terms of n .

Solve the inequality to find the LEAST value of n .

You must show all your working.

(Turn over)

[5 marks]

END OF PAPER

TOTAL 80 MARKS

(Turn over)

Question number	Additional Pages, if required. Write the question number in the left - hand margin.

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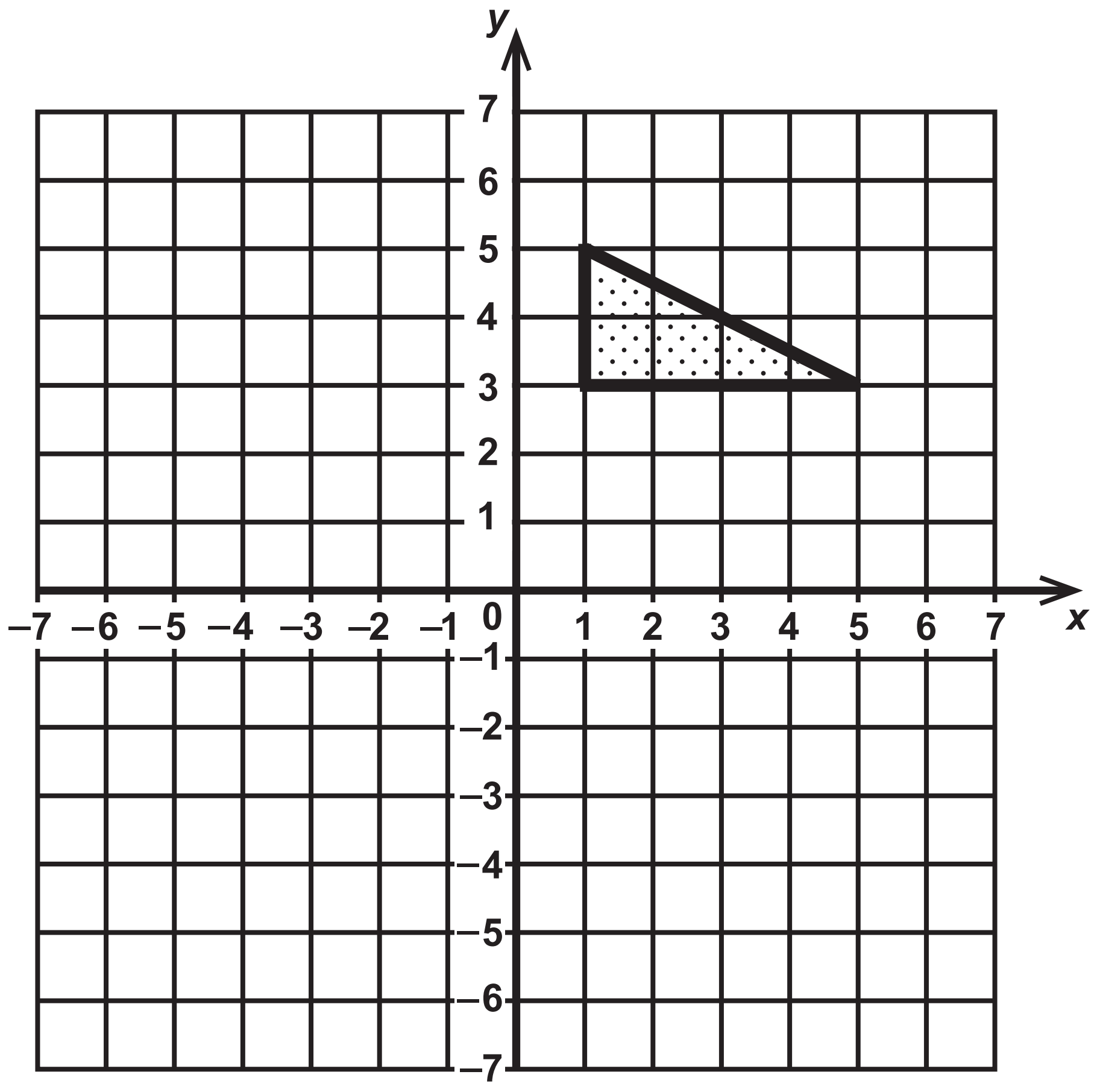
MATHEMATICS
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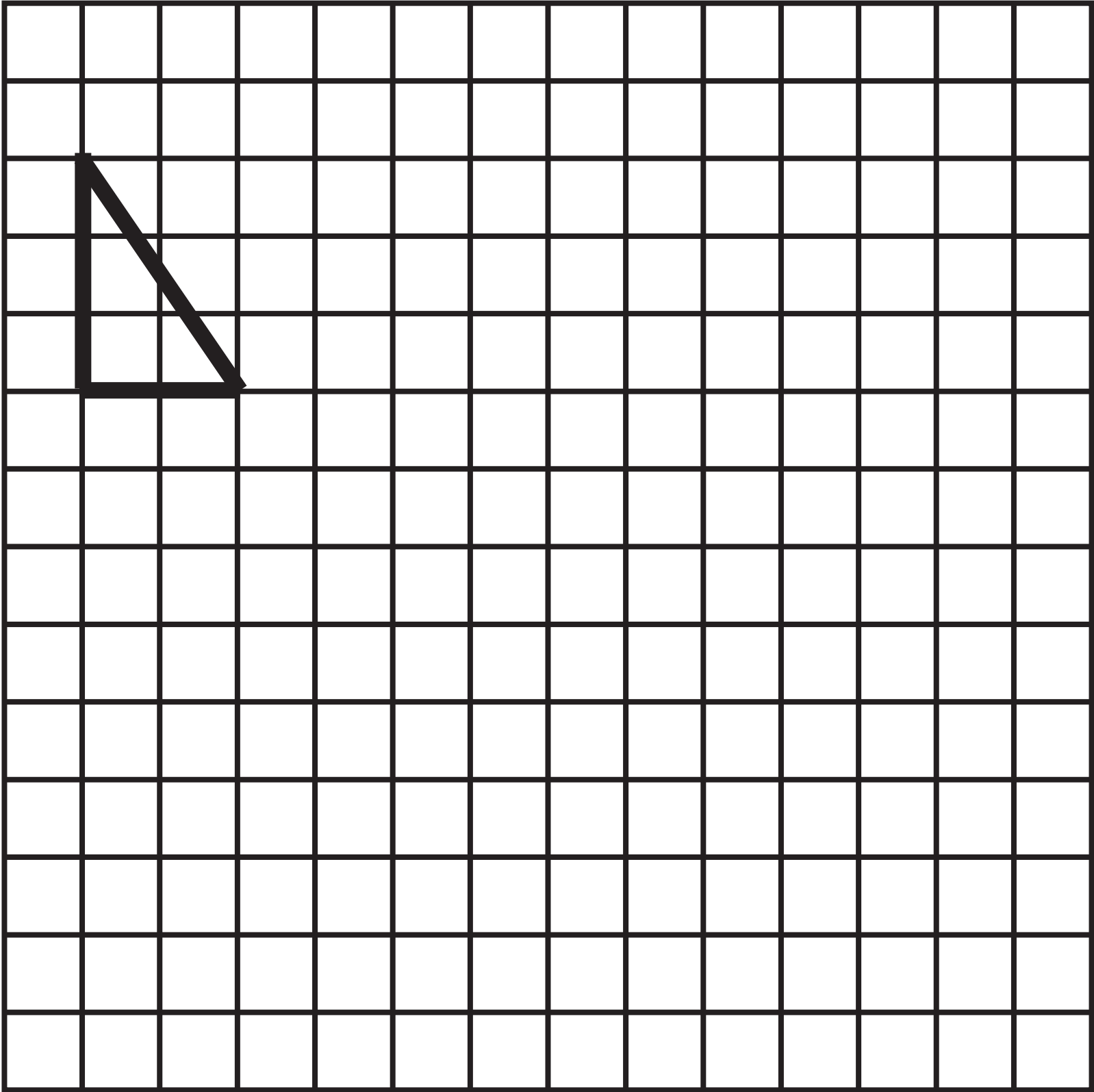
Diagram Booklet

Surname:	
Other Names:	
Centre Number:	
Candidate Number:	0

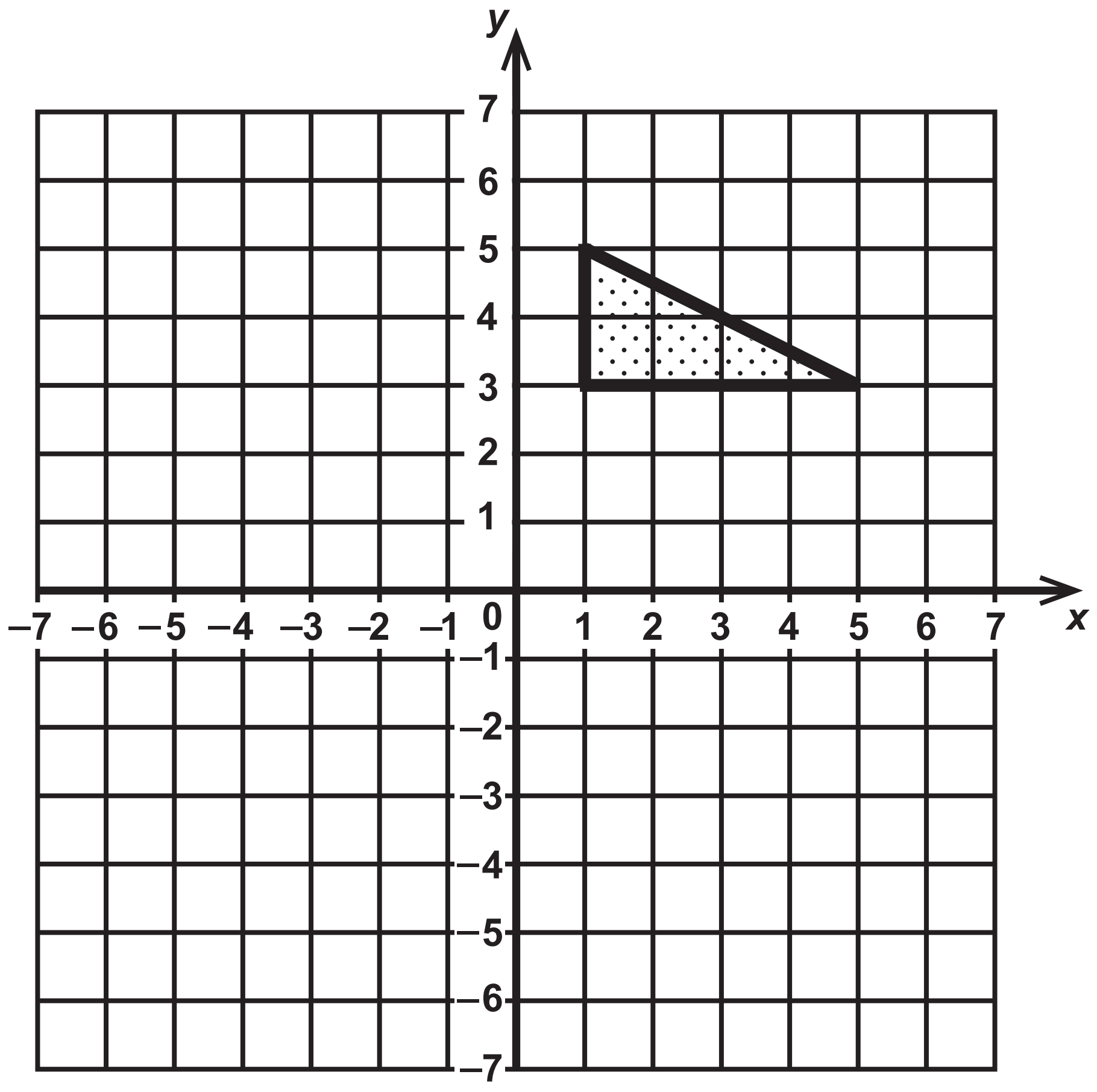
Question 3 (a)



Question 3 (b)



Question 3 (c)



Question 4 (c)
Information

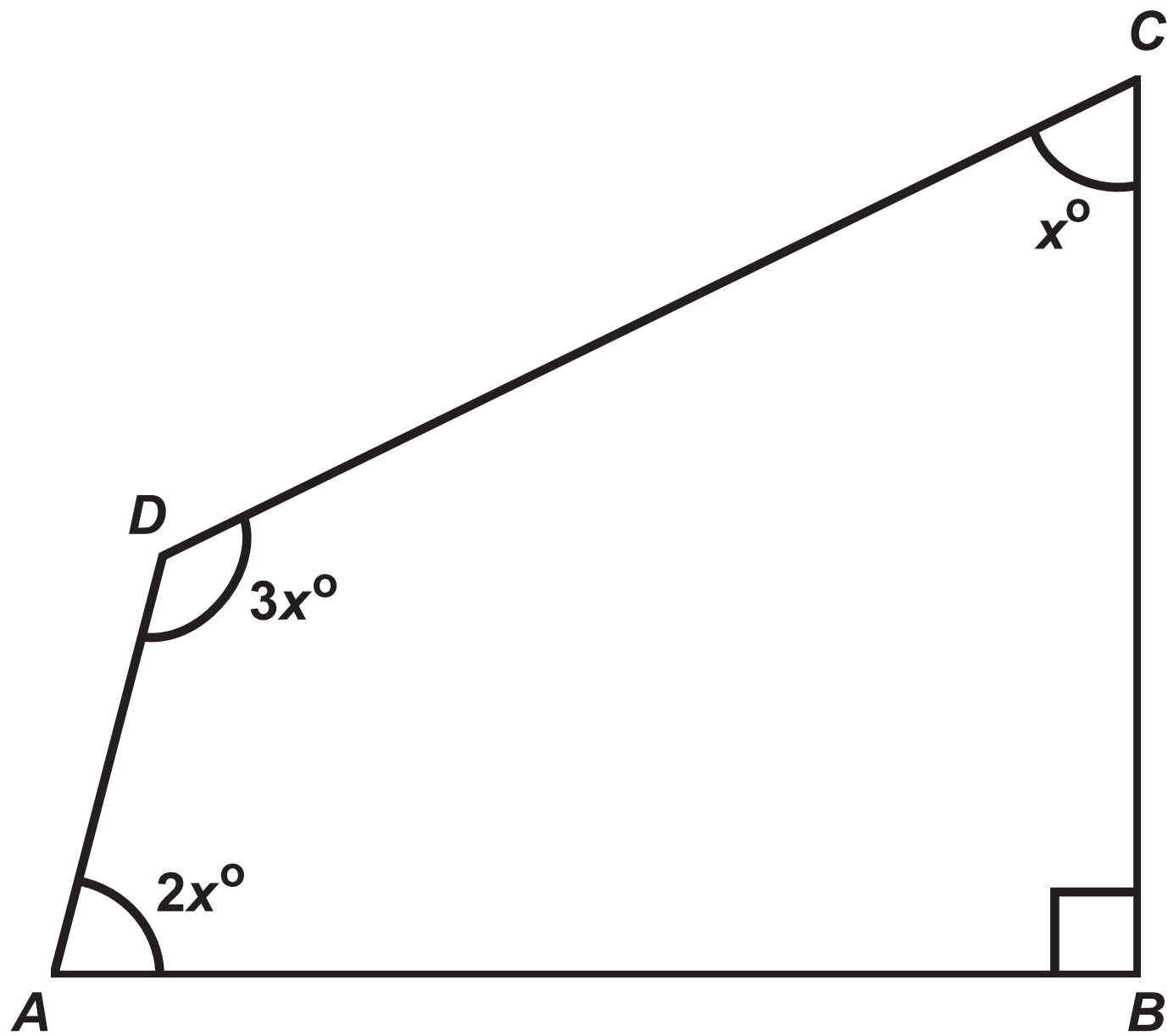
6 blue	5 blue	1 blue	5 blue	6 blue
6 yellow	5 yellow	1 yellow	5 yellow	3 yellow
3 pink	5 pink	5 pink	1 pink	6 pink

Question 6

David → Harlech, Jane → Rhyl and Mary → Porthcawl

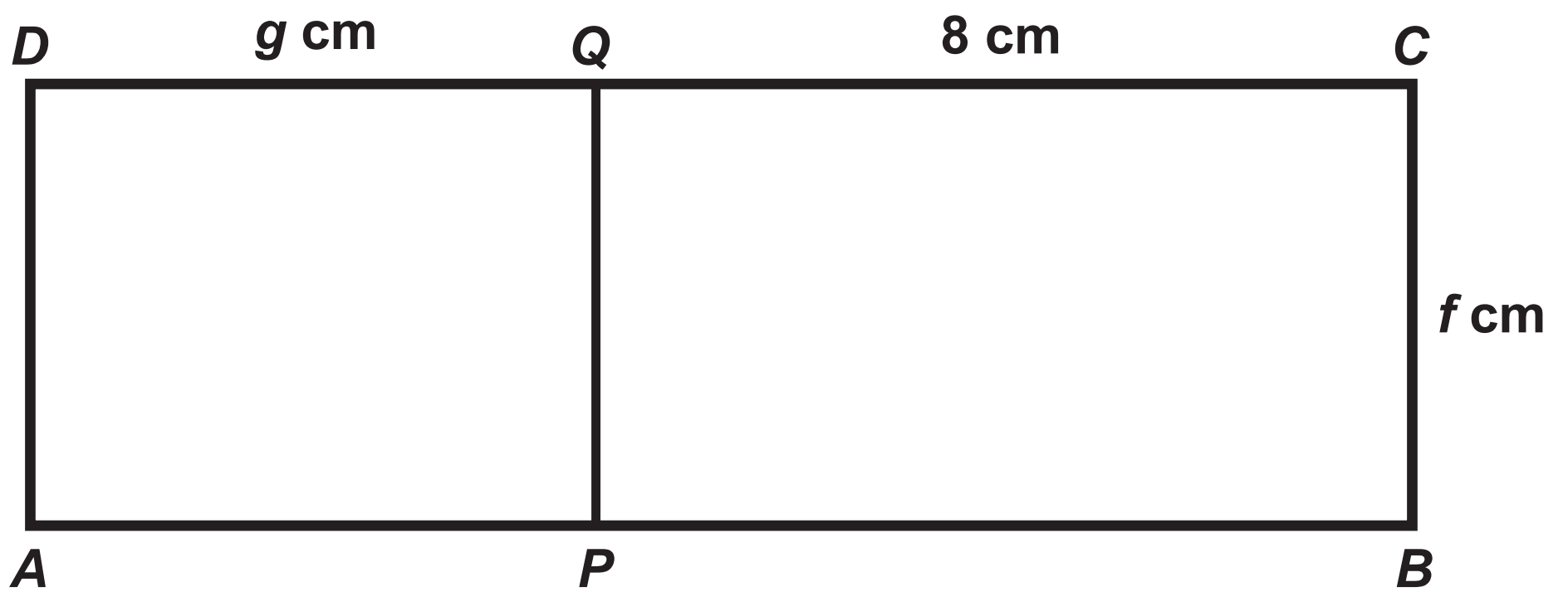
Question 7

Diagram NOT drawn to scale



Question 9

Diagram NOT drawn to scale

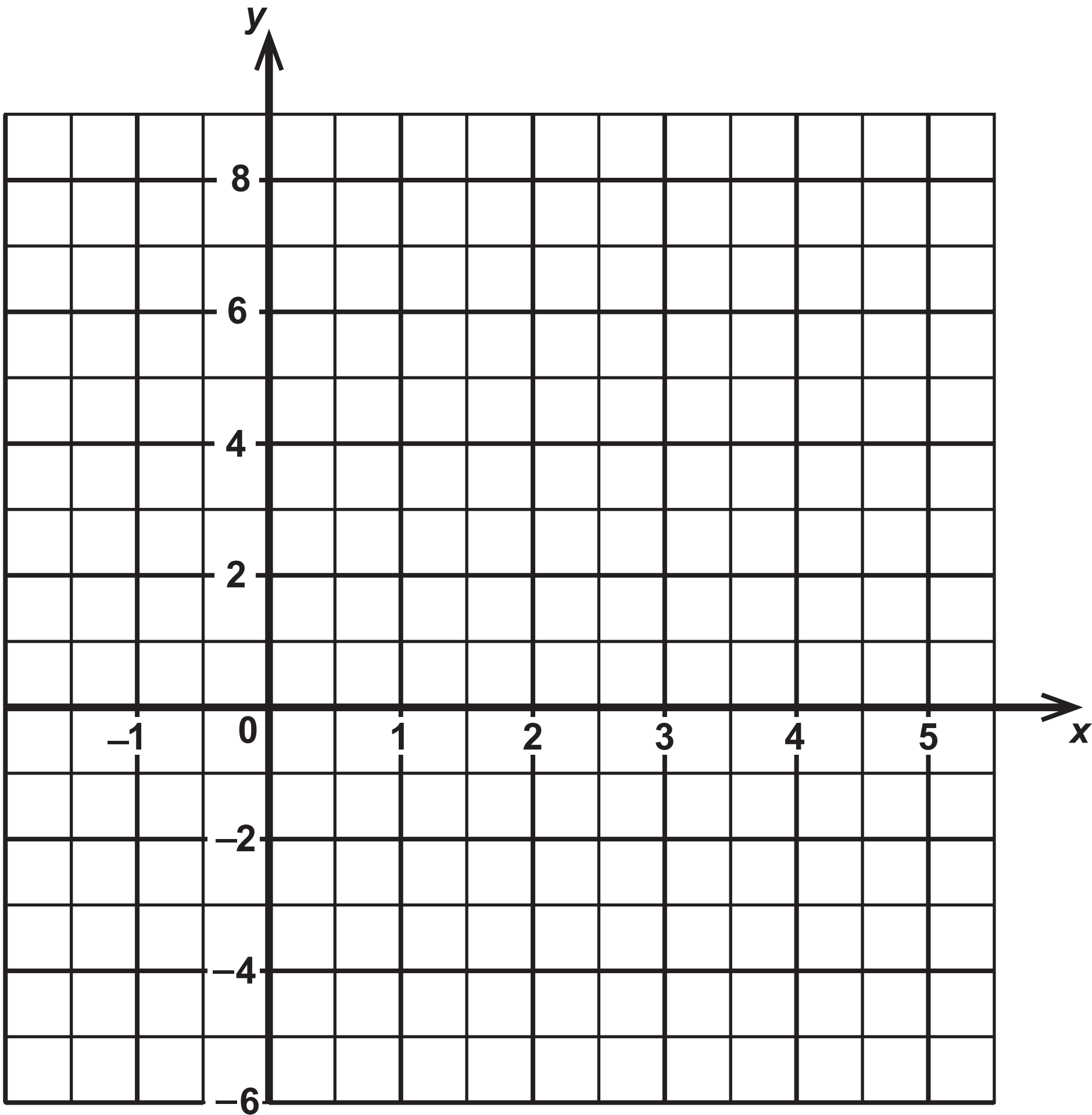


Question 10 (a)

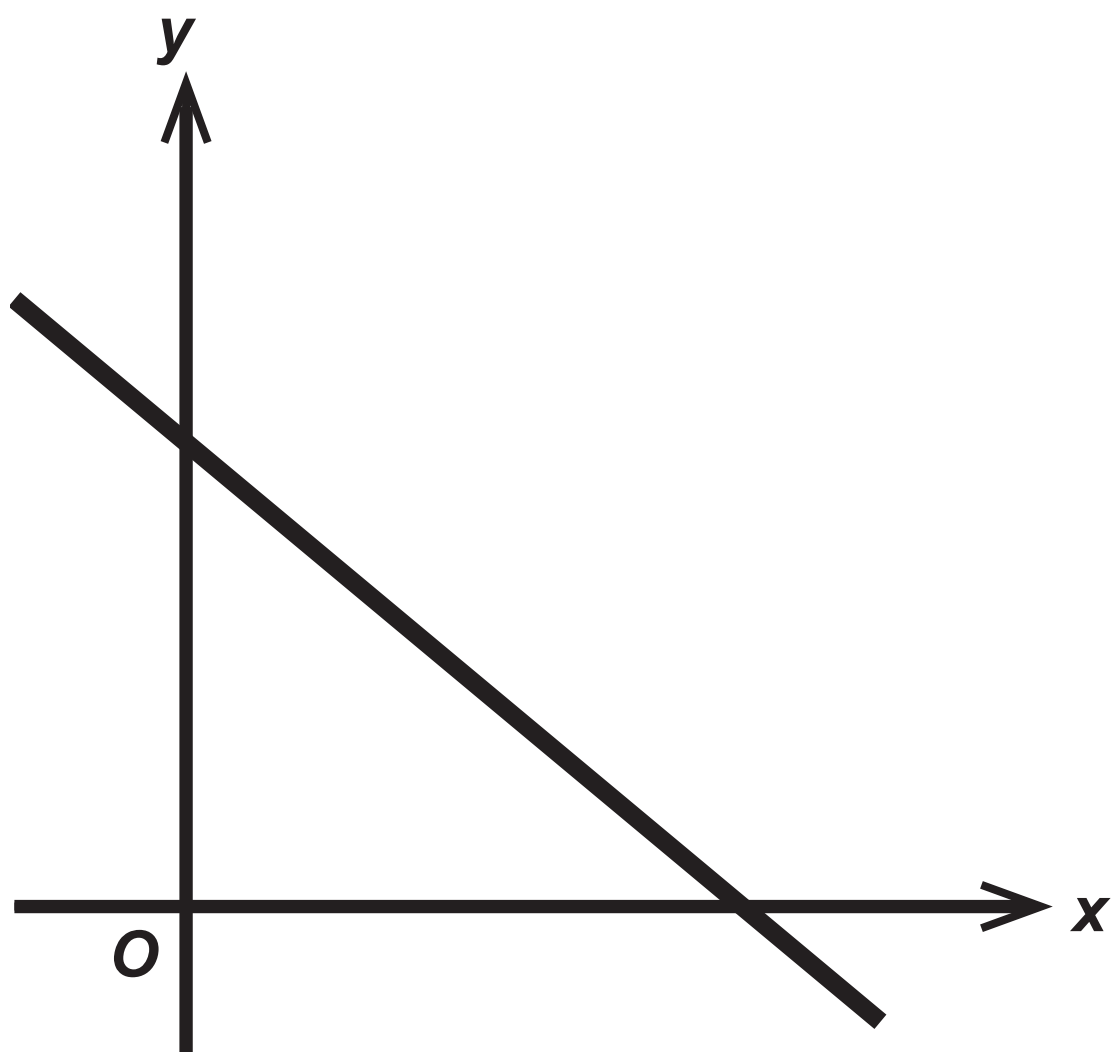
Table

Label	North	East	South	West
Probability	0.4	0.25	0.2	

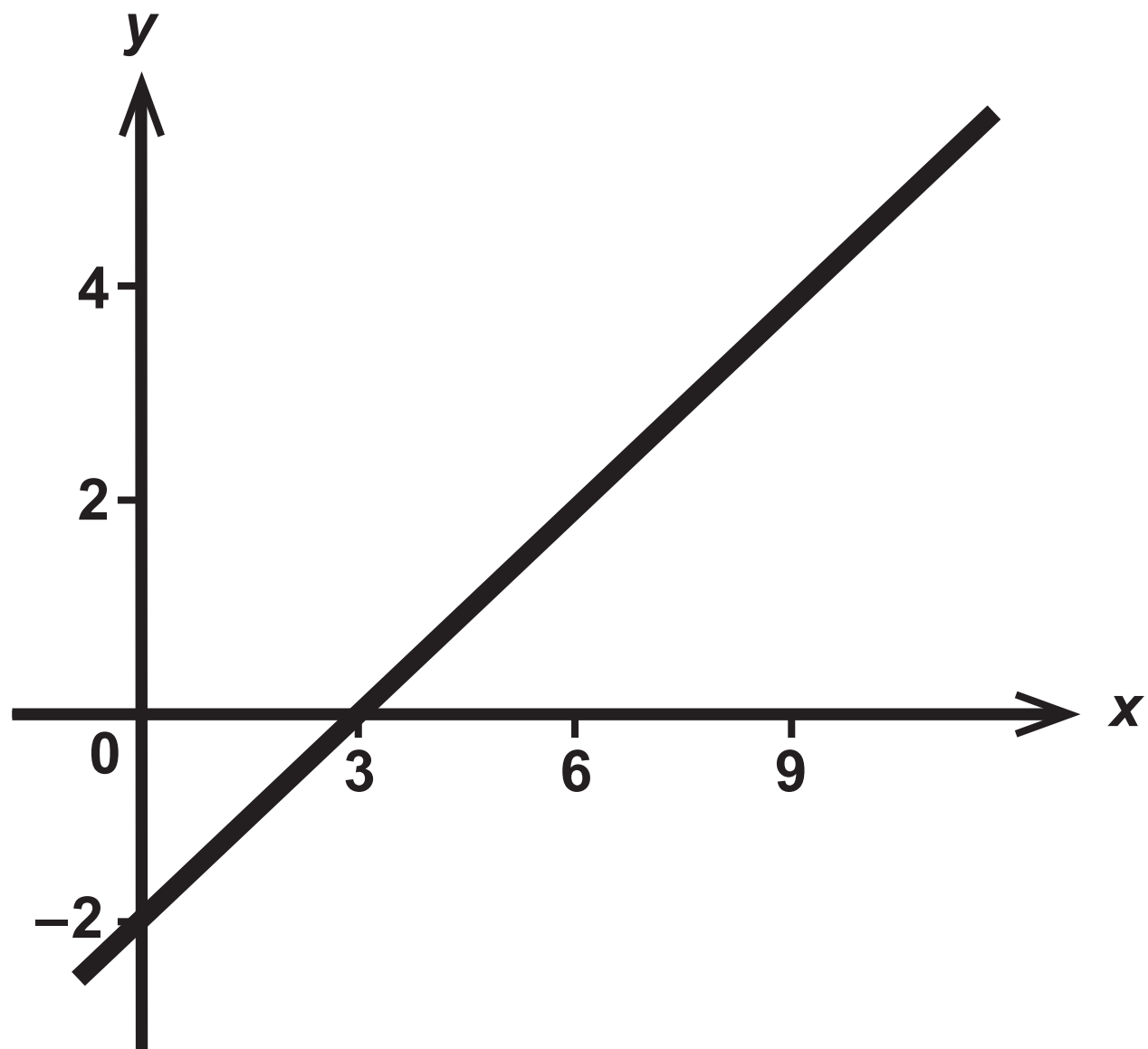
Question 11 (b)



Question 13 (a)



Question 13 (c)



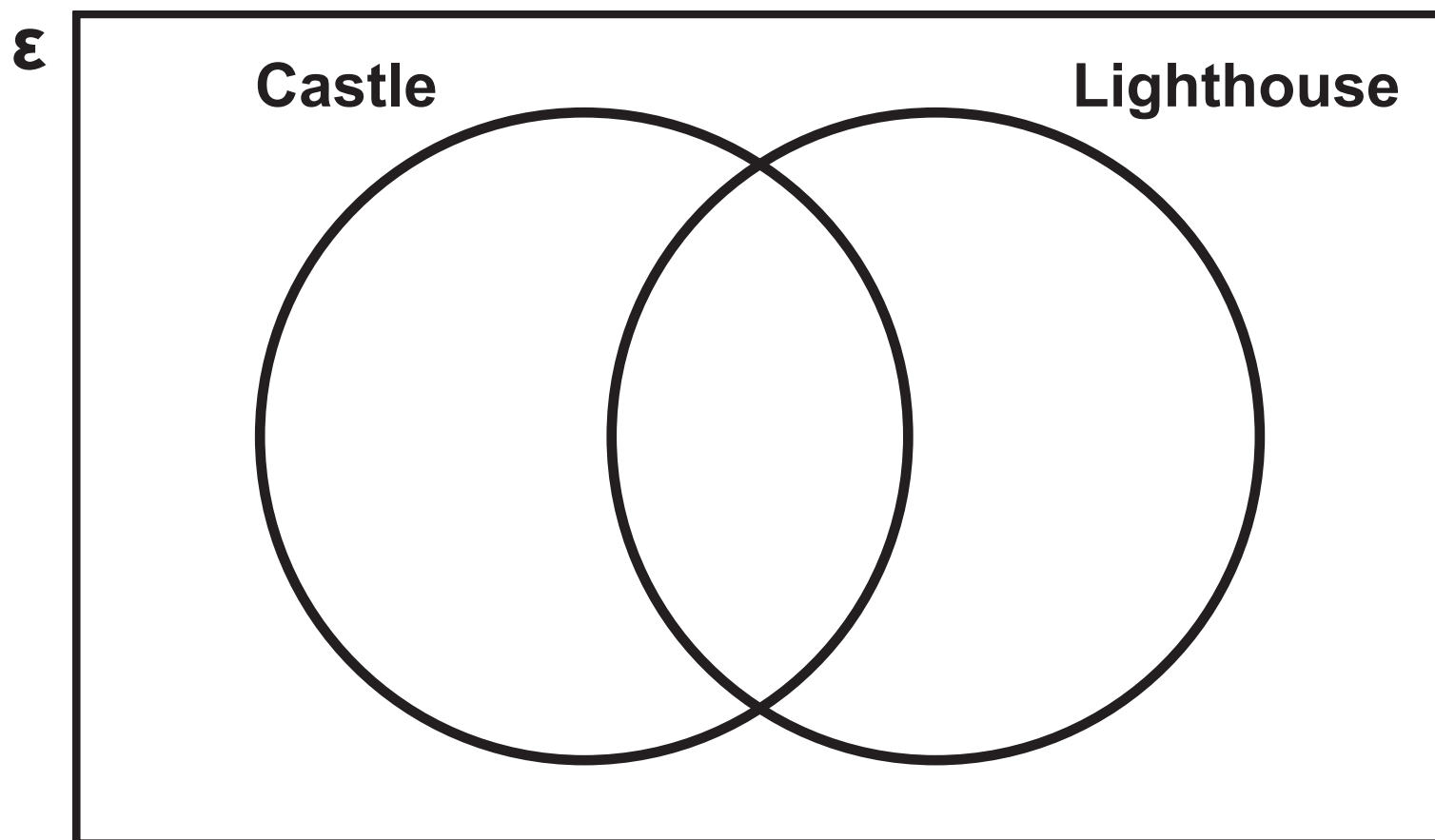
Question 15

Table

FORMULA	FORMULA COULD BE FOR
$d^3 - 3.14r^2h$	volume
$d^2 + hw$	
$d + w + h$	
$2\pi r - \pi r^2$	
$(d + h)w$	
$d^3 + dwh$	

Question 16 (a)

The universal set, $\mathcal{E}$, contains all of the 20 people in the group.



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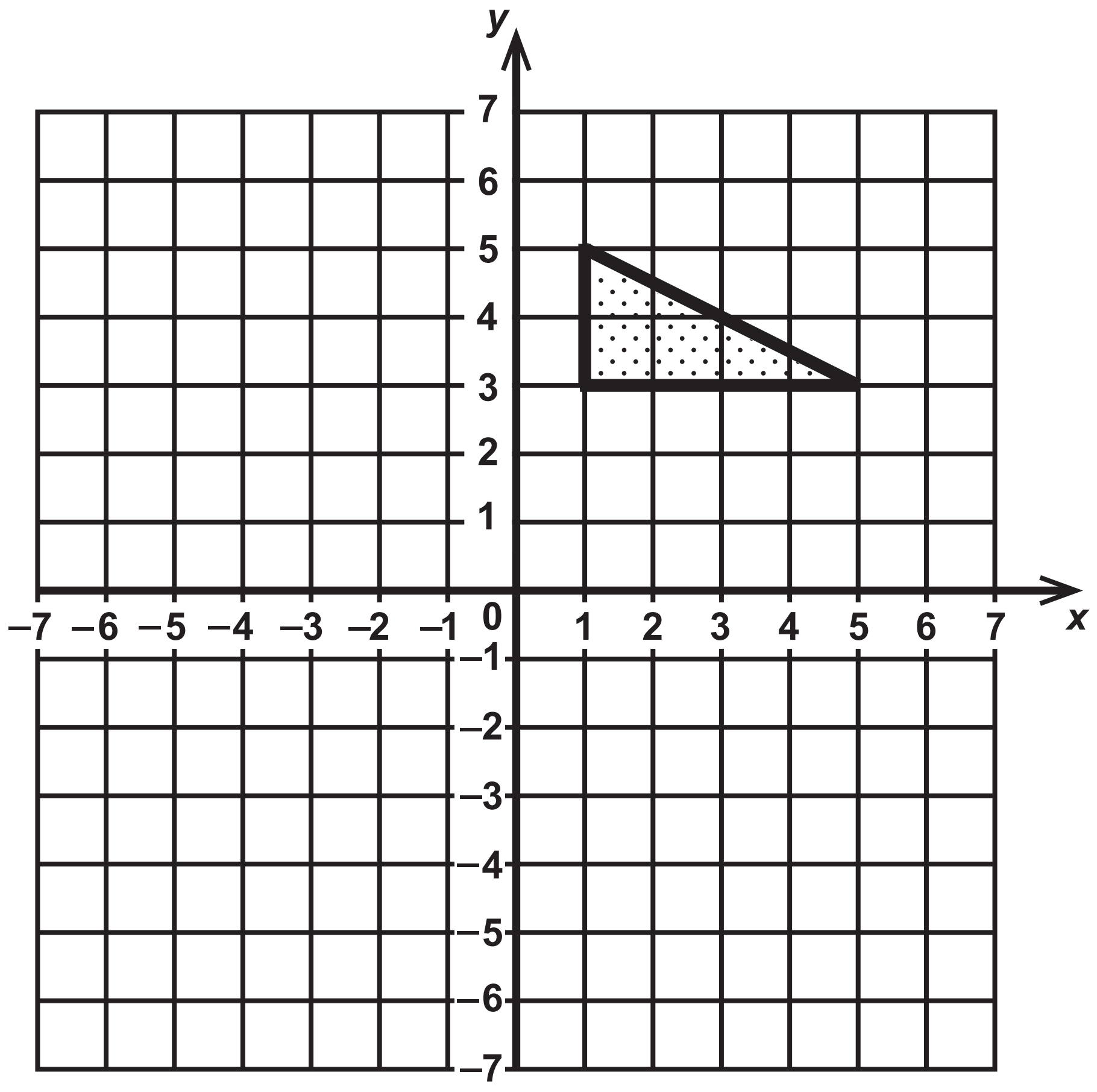
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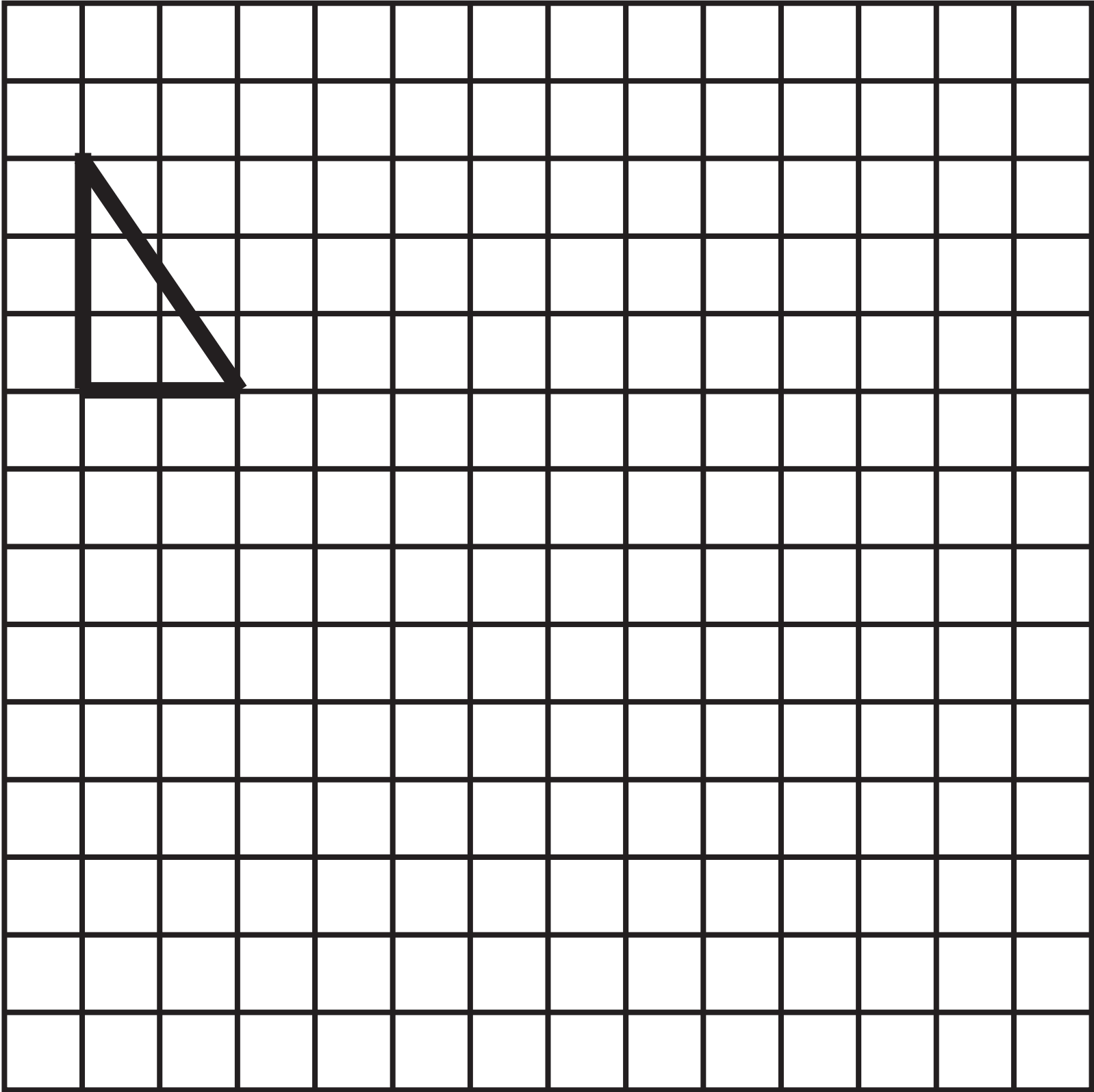
Spare Diagram Booklet

Surname:	
Other Names:	
Centre Number:	
Candidate Number:	0

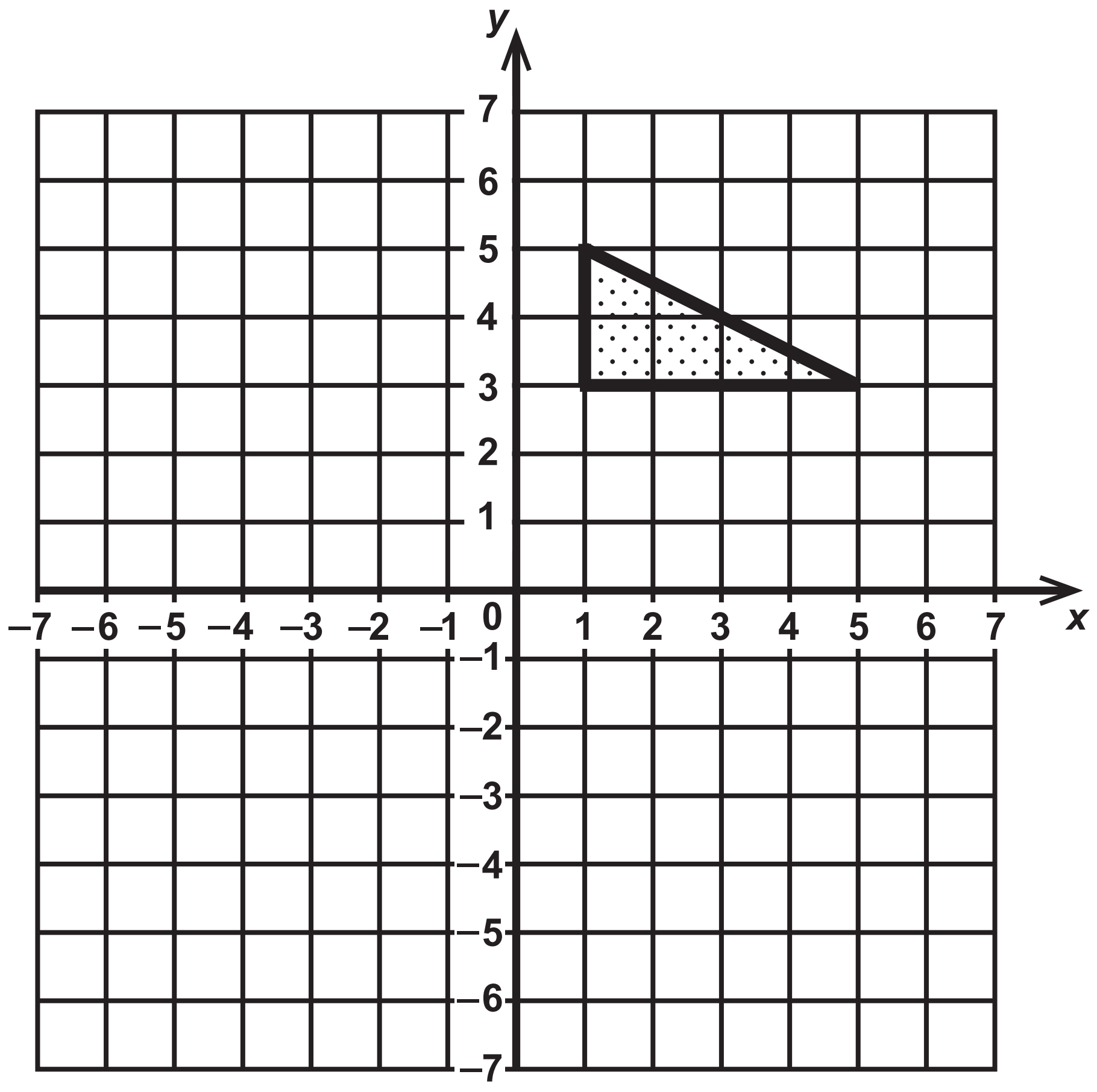
Question 3 (a)



Question 3 (b)



Question 3 (c)



Question 4 (c)
Information

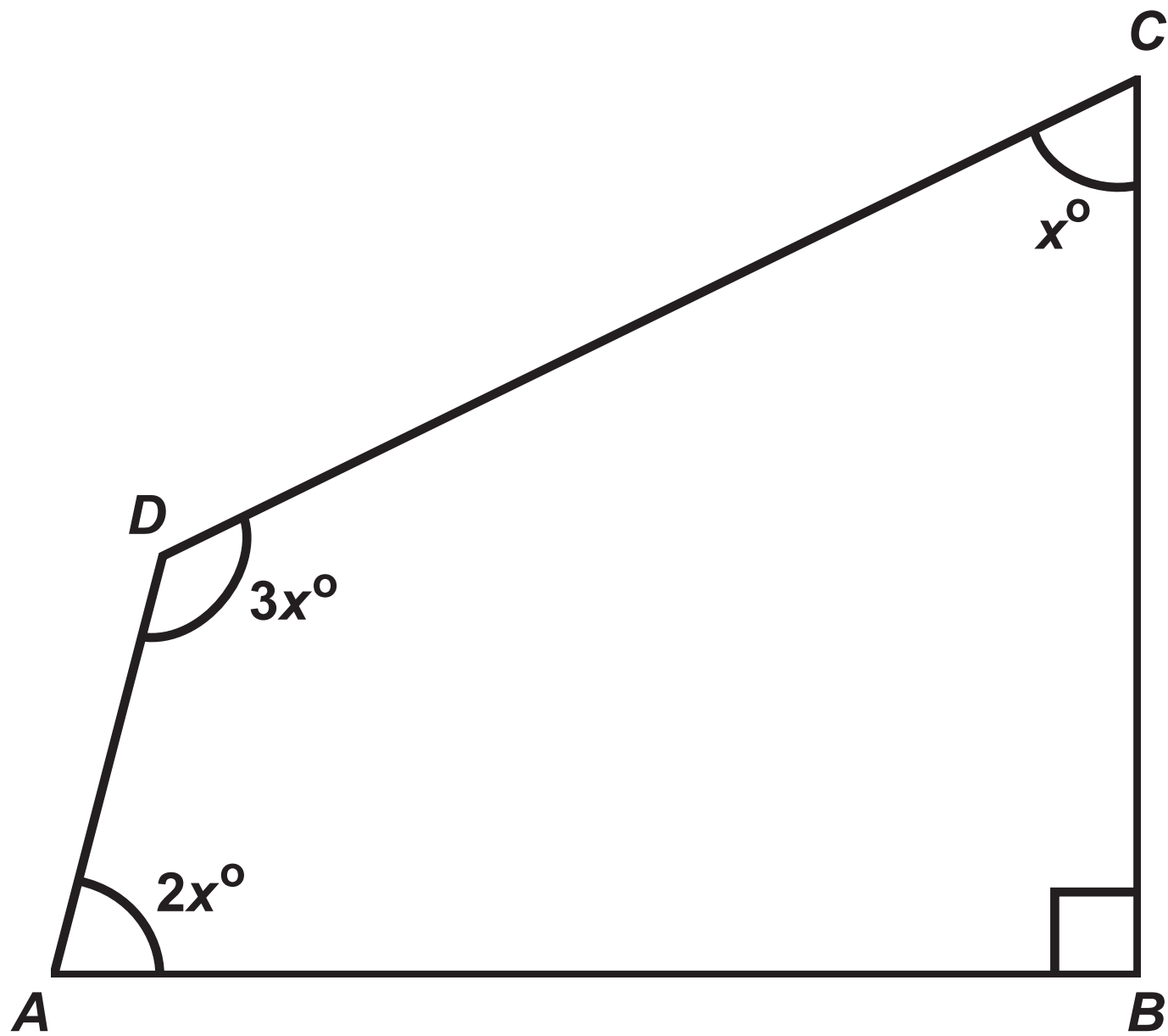
6 blue	5 blue	1 blue	5 blue	6 blue
6 yellow	5 yellow	1 yellow	5 yellow	3 yellow
3 pink	5 pink	5 pink	1 pink	6 pink

Question 6

David → Harlech, Jane → Rhyl and Mary → Porthcawl

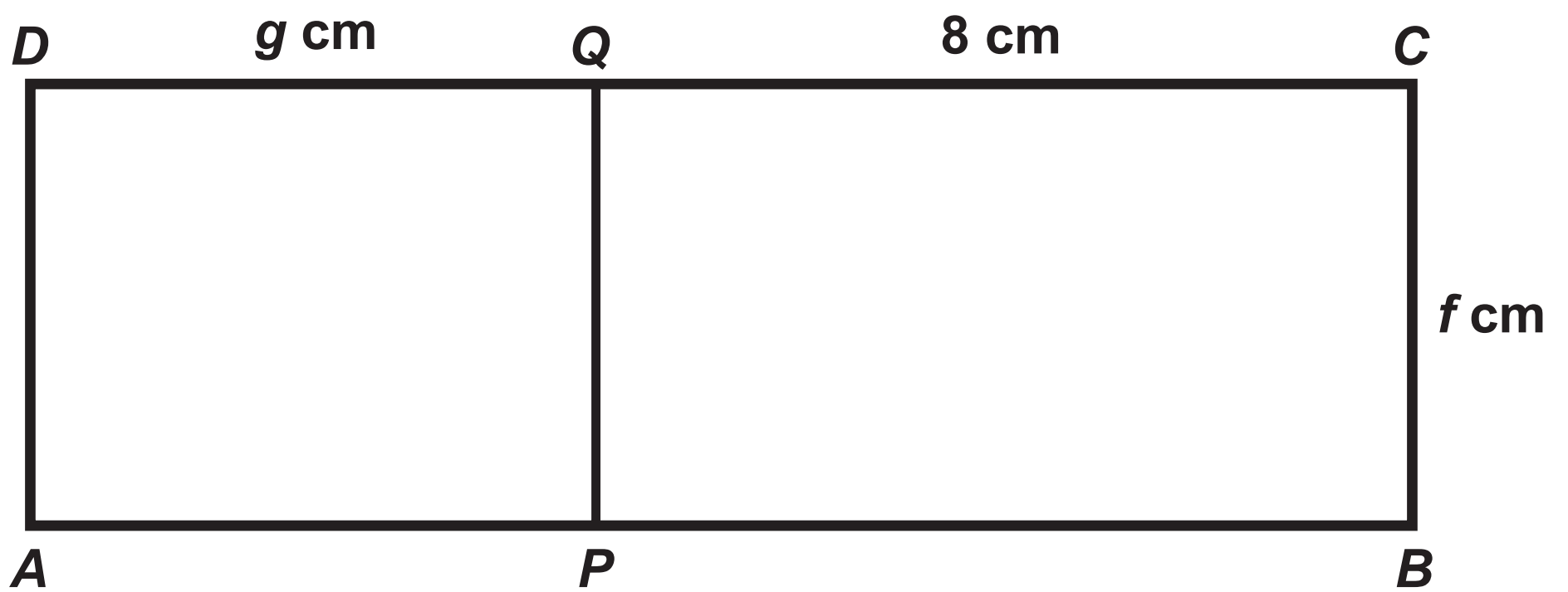
Question 7

Diagram NOT drawn to scale



Question 9

Diagram NOT drawn to scale

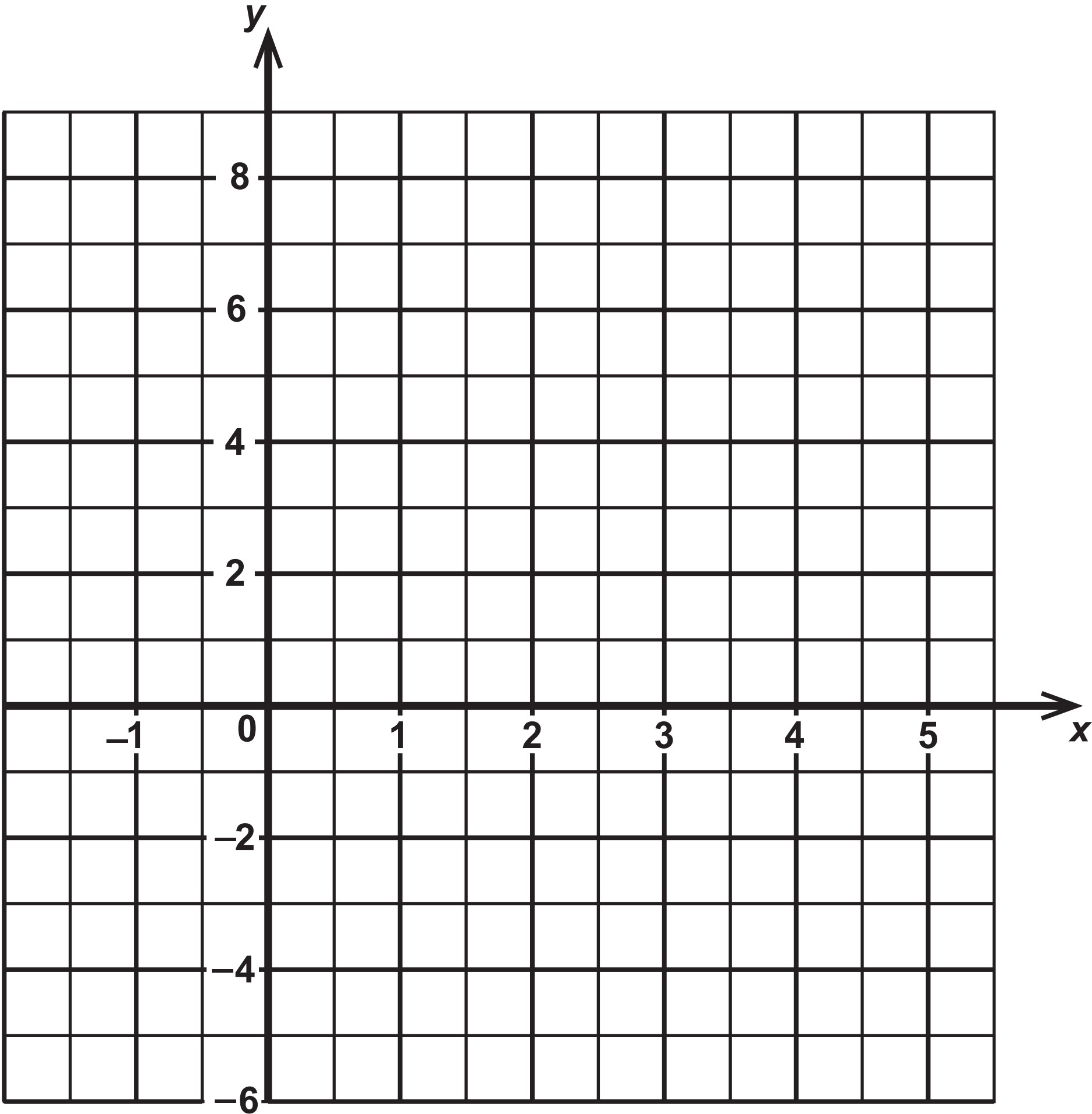


Question 10 (a)

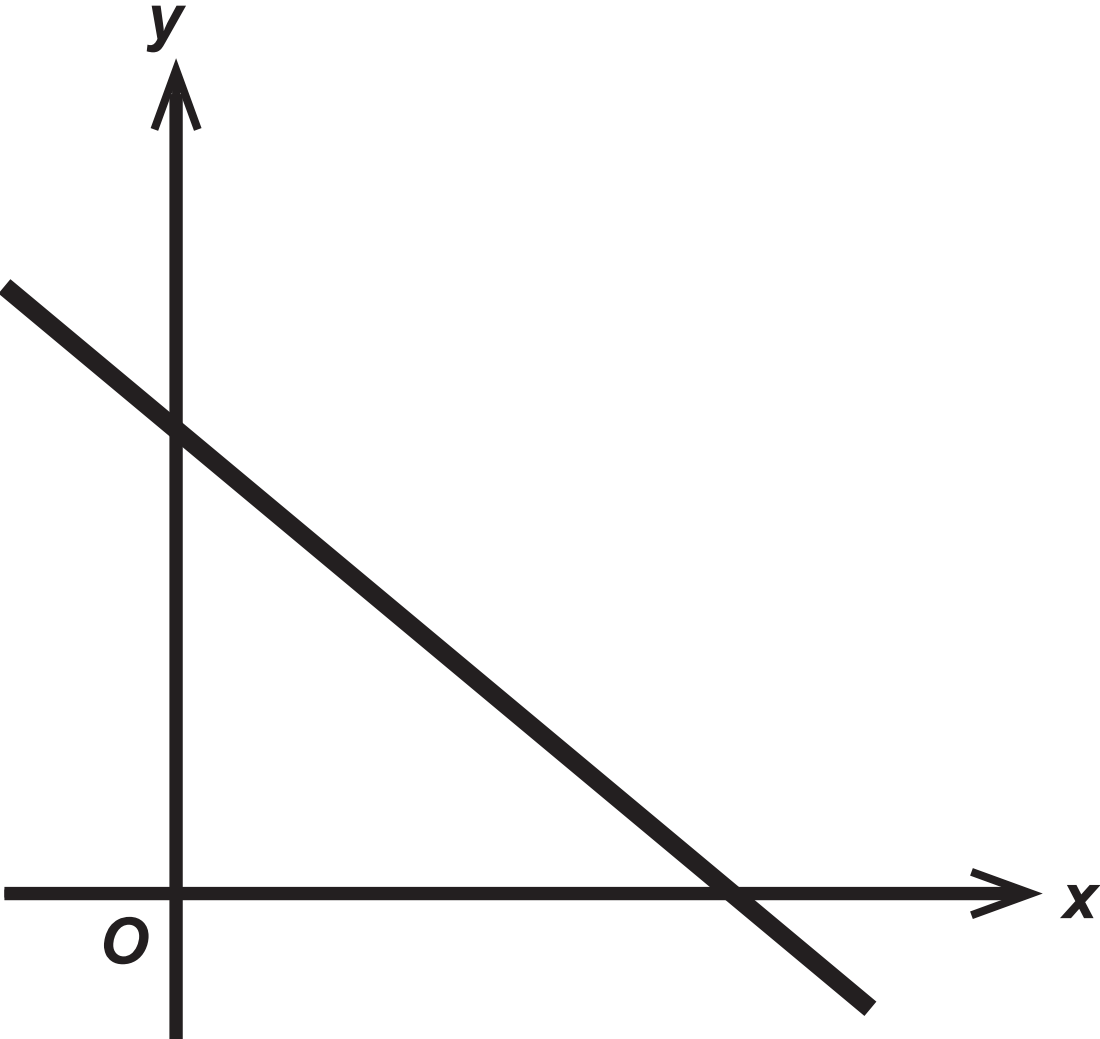
Table

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Probability	0.4	0.25	0.2	

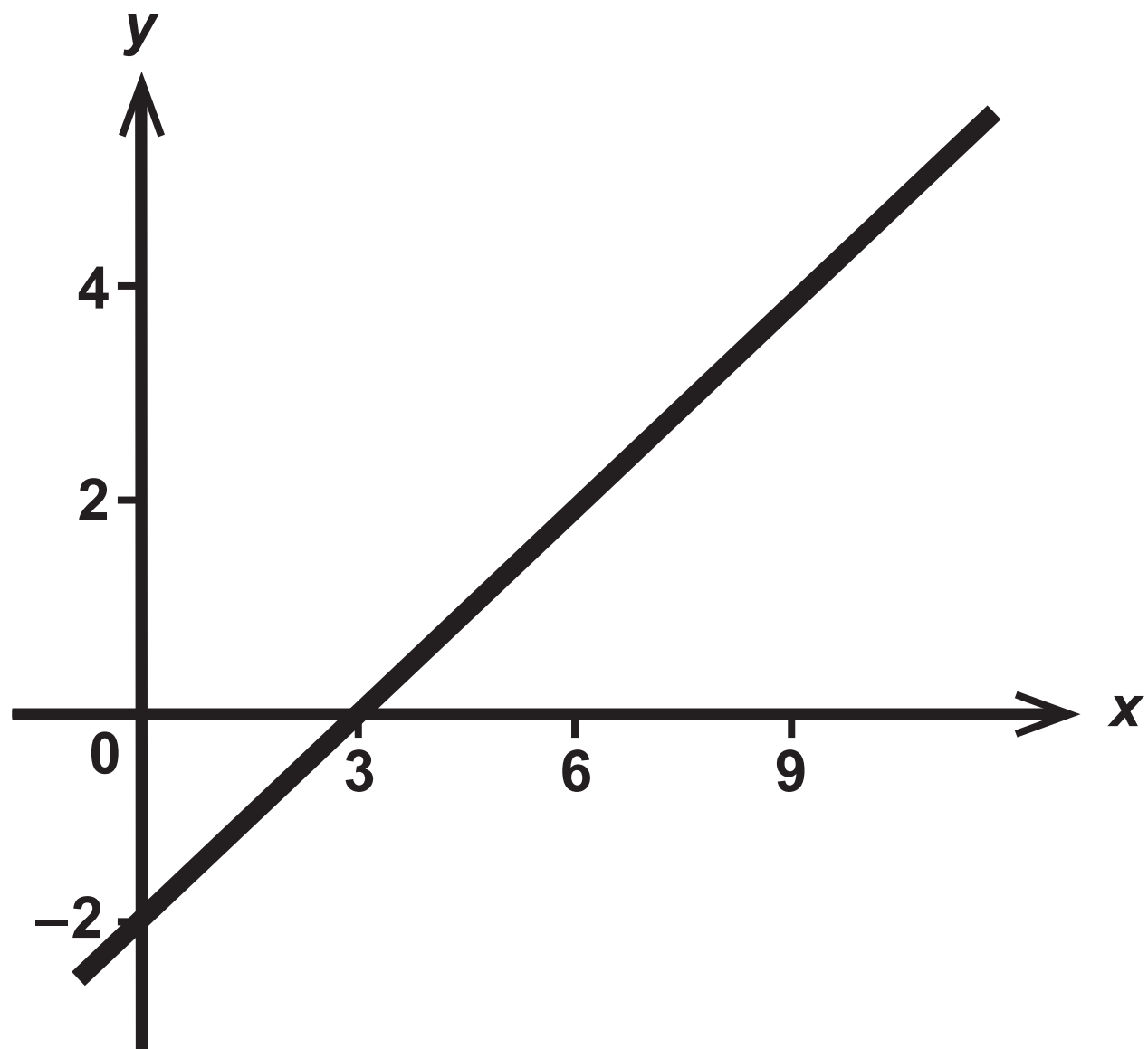
Question 11 (b)



Question 13 (a)



Question 13 (c)



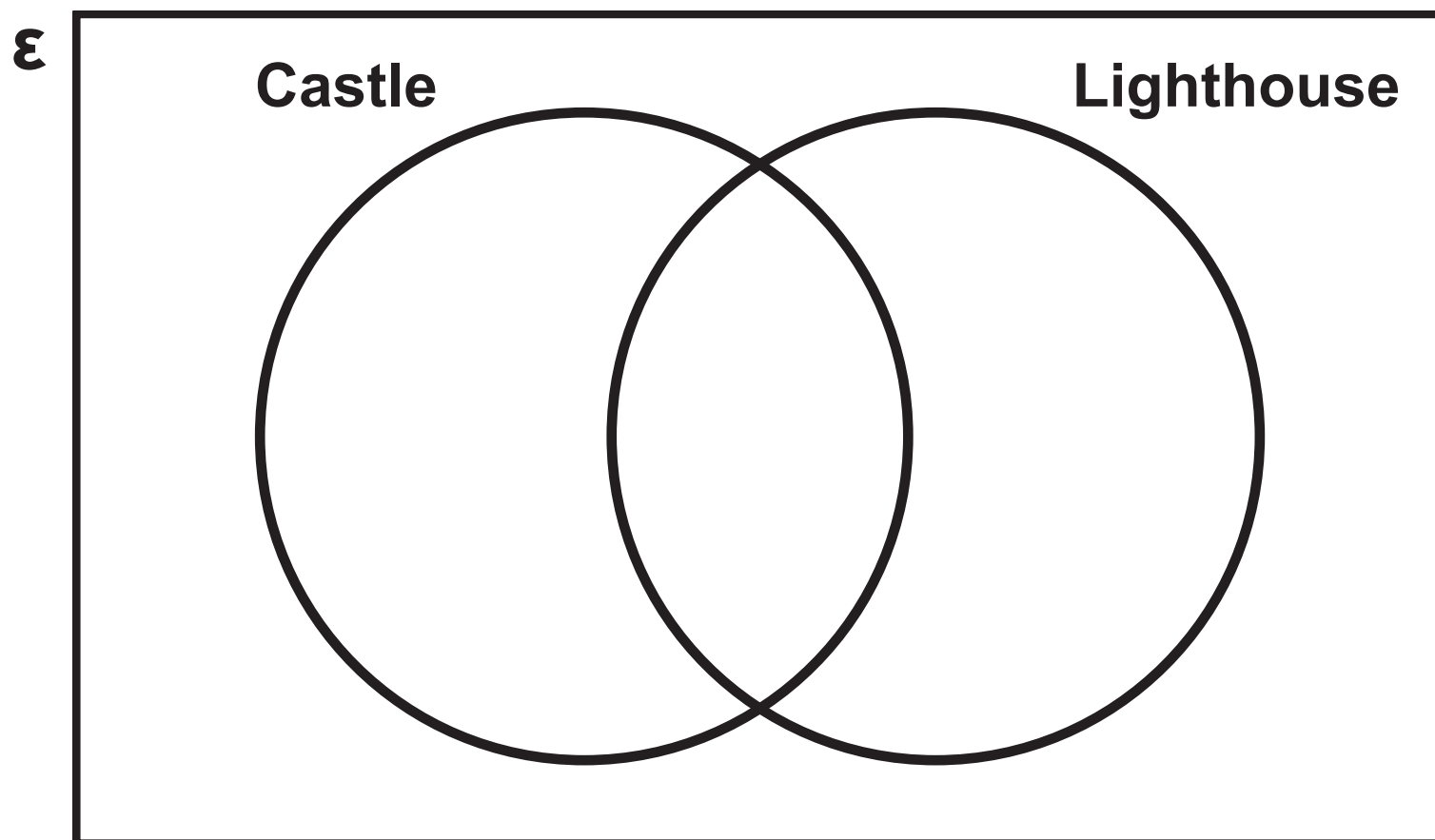
Question 15

Table

FORMULA	FORMULA COULD BE FOR
$d^3 - 3.14r^2h$	volume
$d^2 + hw$	
$d + w + h$	
$2\pi r - \pi r^2$	
$(d + h)w$	
$d^3 + dwh$	

Question 16 (a)

The universal set, $\mathcal{E}$, contains all of the 20 people in the group.



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and

NUMERACY

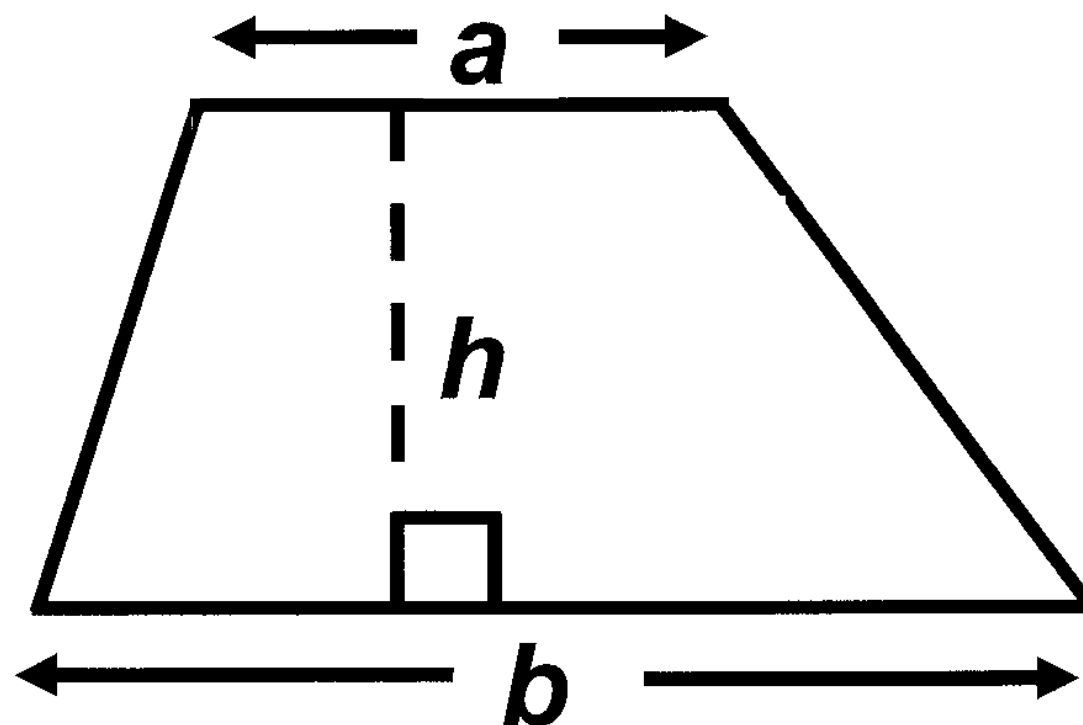
**FORMULA LIST
INTERMEDIATE TIER
GCSE**

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

