GCSE

3300U20-1

WEDNESDAY, 16 NOVEMBER 2022 – MORNING

MATHEMATICS

UNIT 2: CALCULATOR – ALLOWED

FOUNDATION TIER

1 hour 30 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.	3	
2.	4	
3.	1	
4.	2	
5.	7	
6.	4	
7.	2	
8.	4	
9.	2	
10.	2	
11.	3	
12.	5	
13.	9	
14.	2	
15.	2	
16.	4	
17.	4	
18.	5	
Total	65	

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.

Cut out shapes for Question 2 (d) and Question 11 (b).

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 $3{\cdot}14$ or use the π button on your calculator.

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 (c), the assessment will take into account the quality of your linguistic and mathematical accuracy in writing.

In question 12, the assessment will take into account the quality of your organisation and communication.

1. (a) One of the calculations below is incorrect.

Circle the incorrect calculation.

$78 + 9952 = 10030$
$875 \div 35 = 25$
$3685 - 2852 = 833$
$452 \times 63 = 28466$
$89775 \div 45 = 1995$

[1 mark]

continued on the next page . . .

Question 1 continued

1. (b) One of the numbers below is a multiple of 38

Circle the multiple of 38

2	**19**	**338**	**388**	**3838**

[1 mark]

(c) Computers cost £432 each.

How many can be bought with £9876?

[1 mark]

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

The diagram shows five quadrilaterals, A, B, C, D and E.

The special name for one of the quadrilaterals is a kite.

Which quadrilateral is a kite?
Circle the correct answer.

Quadrilateral A
Quadrilateral B
Quadrilateral C
Quadrilateral D
Quadrilateral E

[1 mark]

continued on the next page . . .

Question 2 continued

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

The diagram shows five angles, A, B, C, D and E.

One of the angles shown is an acute angle.

Which angle is an acute angle?
Circle the correct answer.

Angle A
Angle B
Angle C
Angle D
Angle E

[1 mark]

continued on the next page . . .

Question 2 continued

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

The diagram shows five circles,

A, B, C, D, and E.

One of the diagrams shows a chord of a circle.

Which diagram shows a chord of a circle?
Circle the correct answer.

Diagram A
Diagram B
Diagram C
Diagram D
Diagram E

[1 mark]

continued on the next page . . .

Question 2 continued

2. (d) Look at the diagram for Question 2 (d) in the separate Diagram Booklet.
The diagram shows four shaded squares on a grid.

Add two squares to the four shaded squares shown so that the complete diagram forms the net of a cube.

Cut out squares are available for this question.

[1 mark]

3. Complete the calculation below, by finding the TWO missing digits.

5		×	4	7	=	2	4		1

[1 mark]

4. **Look at the diagram for Question 4 in the separate Diagram Booklet.**

The diagram shows a grid.

The point *P* is plotted on the grid.

Steve writes the coordinates of *P* as 1; 5

Explain what is wrong with the way Steve has written the coordinates.

[2 marks]

5. (a) Simplify $3p + 2p - p$

_____

_____

[1 mark]

(b) (i) Look at the diagram for Question 5 (b) (i) in the separate Diagram Booklet.

The diagram shows a sequence of patterns made from dots.

Draw Diagram 4 in the sequence.

[1 mark]

continued on the next page . . .

Question 5 (b) continued

5. (b) (ii) How many dots will there be in Diagram 6?

_____

_____

_____

_____

_____

_____

[2 marks]

continued on the next page . . .

Question 5 continued

5. (c) IN THIS PART OF THE QUESTION, YOU WILL BE ASSESSED ON THE QUALITY OF YOUR LINGUISTIC AND MATHEMATICAL ACCURACY IN WRITING.

Find the value of $7w + 5y$ when

$w = 36$ and $y = 29$

You must show all your working.

[2 marks + 1 mark W]

6. Look at the diagram for Question 6 in the separate Diagram Booklet.

The diagram is an incomplete bar chart.

The 22 pupils in a class were asked,

"What is your favourite pet?"

The pets chosen by the pupils were dog, cat, rabbit and hamster.

Some of the results are shown in the bar chart.

9 pupils in the class chose either rabbit or hamster.

The modal pet is rabbit.

continued on the next page . . .

Question 6 continued

6. (a) Complete the bar chart by drawing the two missing bars.

[2 marks]

(b) One of these pupils is chosen at random. What is the probability that this pupil's favourite pet is a cat?

[2 marks]

7. Most numbers have an EVEN number of factors.

For example,

7 has TWO factors: 1 and 7

8 has FOUR factors: 1, 2, 4 and 8

Some numbers have an ODD number of factors.

There is one number between 14 and 20 that has an ODD number of factors.

Find this number.

Write down all the factors of this number.

You must show all your working.

The number is _____

The factors of this number are

_____

[2 marks]

8. Calculate each of the following.

(a) $2 \cdot 7$ squared

_____

_____

[1 mark]

(b) the square root of $11 \cdot 56$

_____

_____

[1 mark]

(c) 60% of 28

_____

_____

_____

[2 marks]

9. Shelley thinks of a number.

$\frac{1}{5}$ **of her number is** 46

What is Shelley's number?

[2 marks]

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

The diagram shows a blank spinner.

Mark is making an 8 – sided spinner.

All of the sections on his spinner are identical.

Mark is going to label each of the sections with one of three colours: blue (B), yellow (Y) or red (R).

Label the spinner so that when the spinner is spun:

- **landing on red and landing on blue are EQUALLY LIKELY**

  AND

- **it is LIKELY that the spinner lands on yellow.**

[2 marks]

11. (a) Look at the diagram for Question 11 (a) in the separate Diagram Booklet.
The diagram shows a shape on a grid of squares.

Enlarge the shape by a scale factor of 3

[2 marks]

(b) Look at the diagram for Question 11 (b) in the separate Diagram Booklet.
The diagram shows a shape on a coordinate grid.

Translate the shape 2 squares to the left and 4 squares down.

A cut out shape is available for this question.

[1 mark]

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

Look at the diagram for Question 12 in the separate Diagram Booklet.
The diagram is NOT drawn to scale.

In the diagram, AF is a straight line.

Angle $CDE = 110^\circ$

Angle $DCB = 123^\circ$

Angle $CBA = 112^\circ$

Angle $DEF = x$.

Calculate the size of angle x.
You must show all your working.

[4 marks + 1 mark OC]

13. Laura puts 90 counters in a bag.

Each counter is red or blue or yellow.

Laura wants to draw a pie chart to show the number of counters of each colour.

The table below shows some of the information that she needs.

	NUMBER OF COUNTERS	PIE CHART ANGLE
Red	25	
Blue		180°
Yellow		
	Total = 90	

(a) Complete the table above.

You must show all your working.

[5 marks]

13. (b) Look at the diagram for Question 13 (b) in the separate Diagram Booklet.
The diagram shows an incomplete pie chart.

Complete the pie chart to show the results from the table on the previous page.

[2 marks]

continued on the next page . . .

Question 13 continued

13. (c) Laura chooses a counter at random from the bag.

Calculate the probability that this counter is either red or blue.

[2 marks]

14. Find the whole number that satisfies all of the following conditions:

- **It is a whole number between 15 and 35 inclusive.**
- **The number is a multiple of 2 but not a multiple of 4**
- **3 is a factor of this number, but 9 is NOT a factor of this number.**

_____

_____

_____

The whole number is _____

[2 marks]

15. Calculate $\frac{15 \cdot 4^2}{14 \cdot 59 - 7 \cdot 67}$, correct to

1 decimal place.

[2 marks]

16. **125** pupils were asked which one of four primary schools they attended.

(a) One of the pupils is chosen at random.

Complete the table below to find the probability that the pupil chosen went to Ysgol Bryn.

	Probability
Ysgol Aber	0·08
Ysgol Bryn	
Ysgol Castell	0·2
Ysgol Dewi	0·28

[2 marks]

Question 16 continued

16. (b) How many of the 125 pupils went to Ysgol Dewi?

[2 marks]

17. Look at the diagram for Question 17 in the separate Diagram Booklet.
The diagram IS drawn to scale.

Point *A* and point *B* are shown in the scale drawing.
The scale is 1 cm represents 5 km.

(a) Point *C* is 30 km from point *B* on a bearing of 310°
Complete the scale drawing to show the position of point *C*.

_____

_____

[2 marks]

continued on the next page . . .

Question 17 continued

17. (b) Use your scale drawing to calculate

- **the ACTUAL length of AC,**

  in kilometres,

- **the bearing of point C from point A.**

_____

_____

_____

Actual length of AC = _____ km

Bearing of point C from point A

= _____ °

[2 marks]

18. (a) Express $21{\cdot}76$ as a percentage of 32

[2 marks]

continued on the next page . . .

Question 18 continued

18. (b) Solve $5t + 3 = 3t + 14$

[3 marks]

END OF PAPER

TOTAL 65 MARKS

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

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FOUNDATION TIER

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

Diagram Booklet

Surname: _____

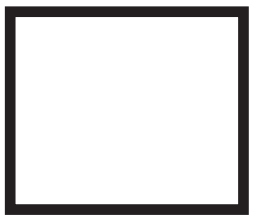
First name(s): _____

Centre Number: _____

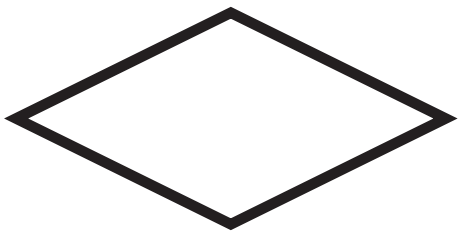
Candidate Number: 0_____

Question 2 (a)

Quadrilateral A

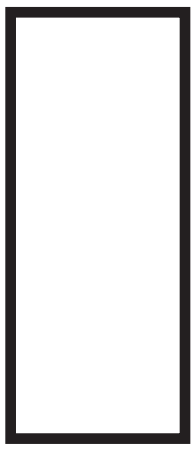


Quadrilateral B

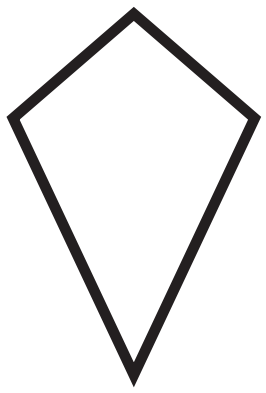


Quadrilateral C

Quadrilateral D

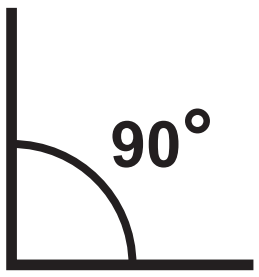


Quadrilateral E

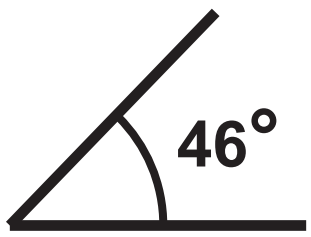


Question 2 (b)

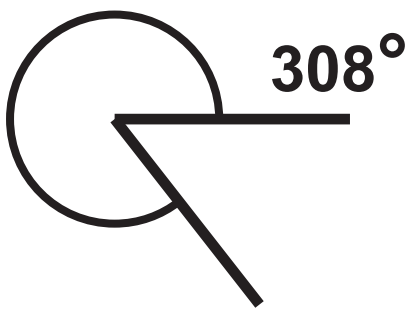
Angle A



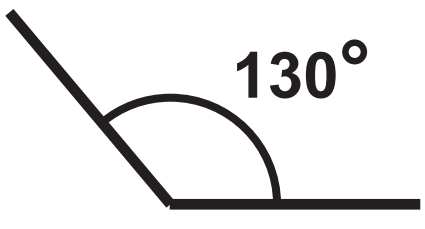
Angle B



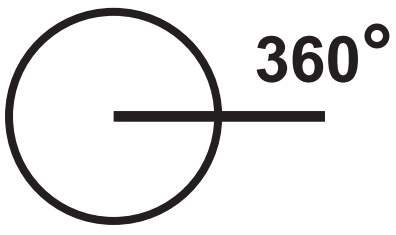
Angle C



Angle D



Angle E



Question 2 (c)

Diagram A

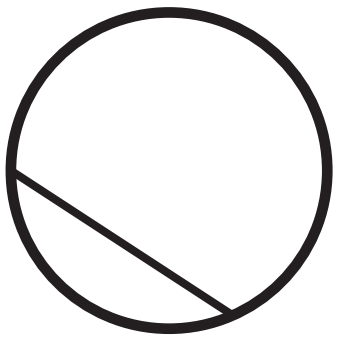


Diagram B

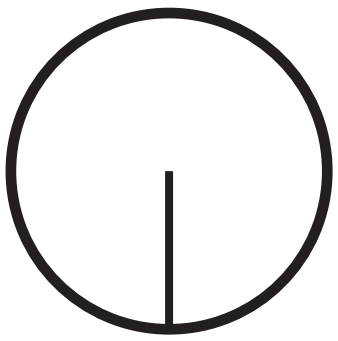


Diagram C

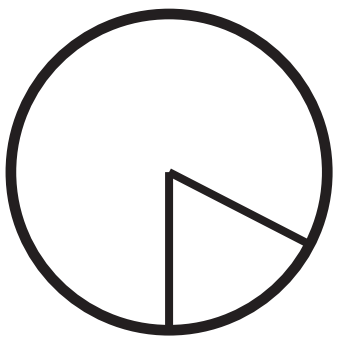


Diagram D

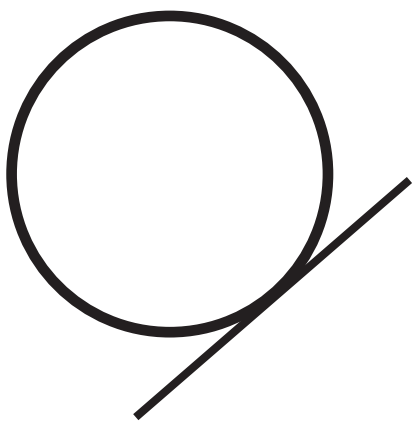
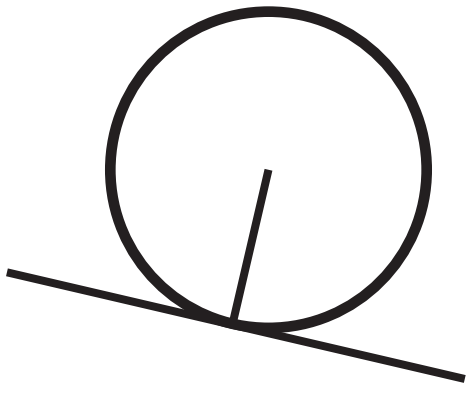
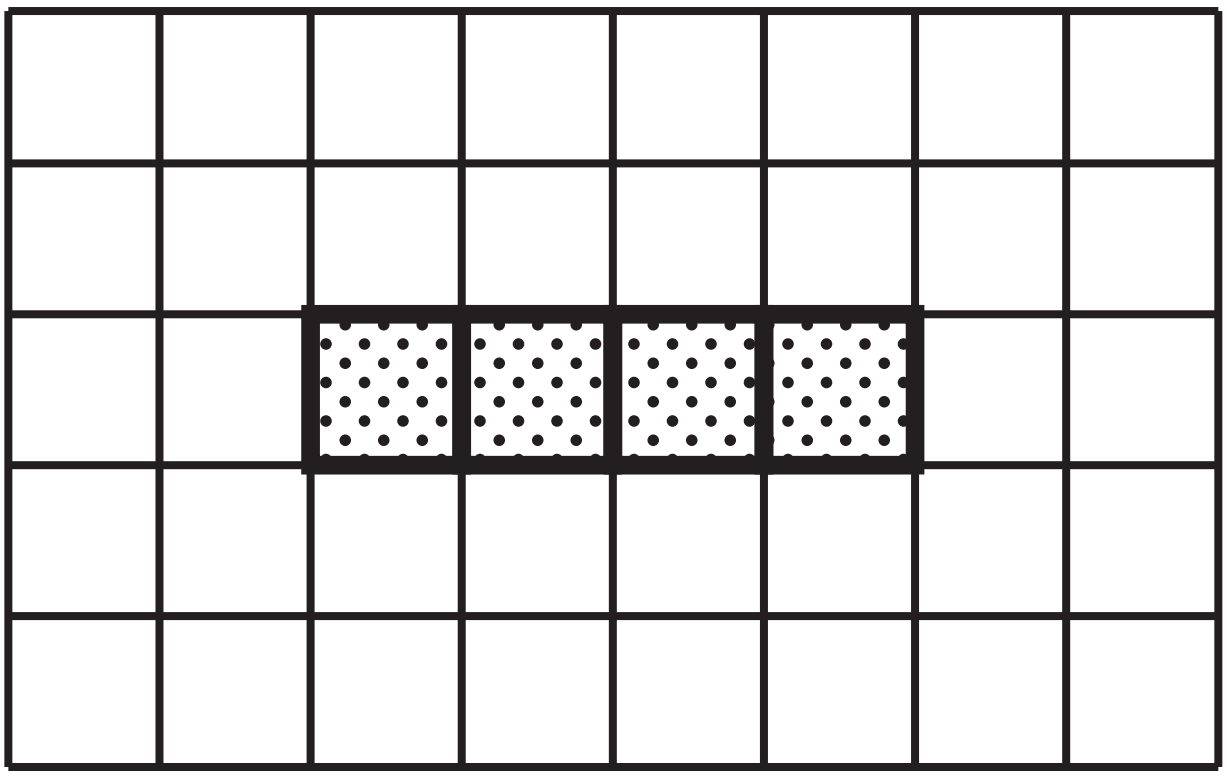


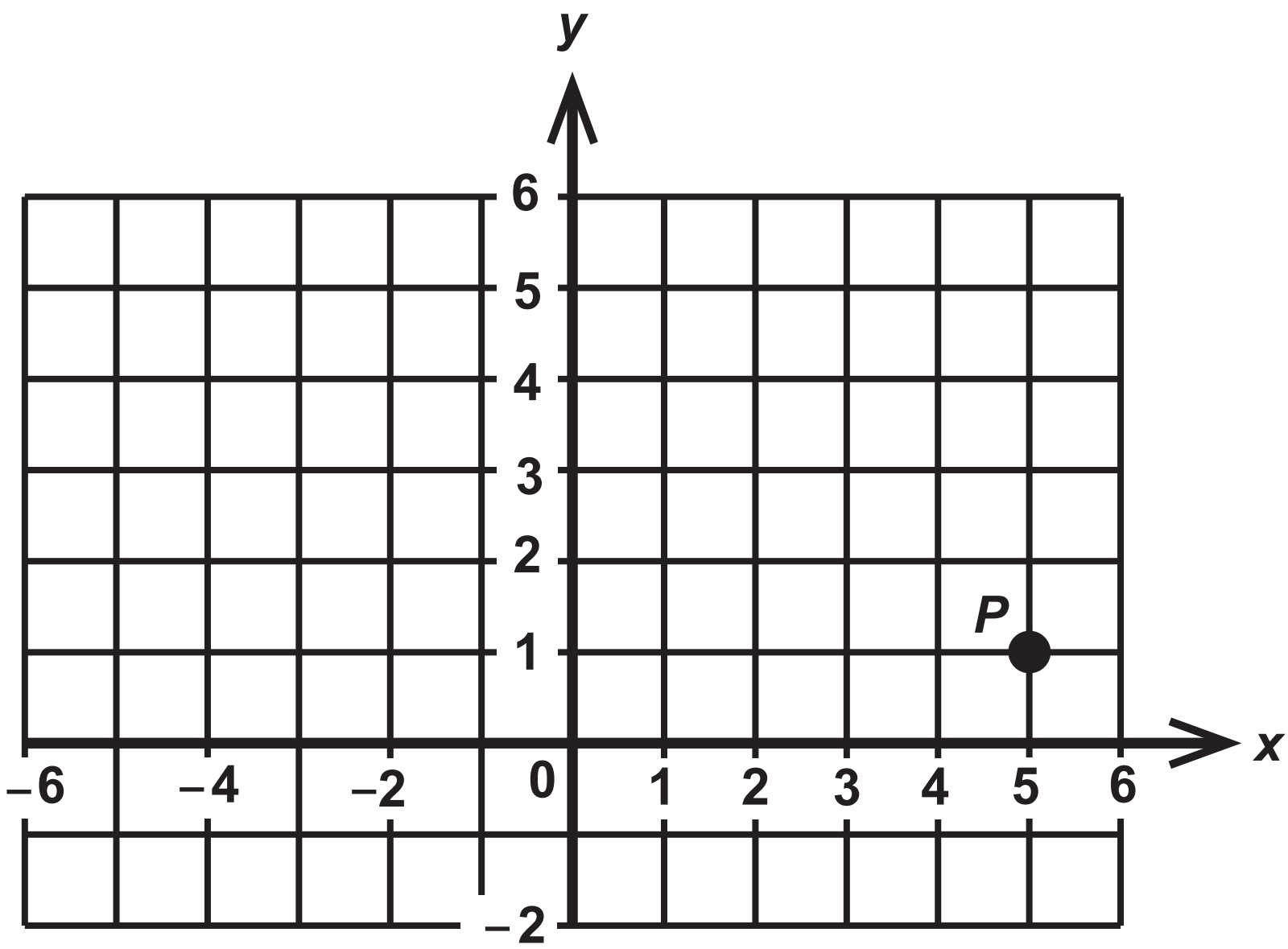
Diagram E



Question 2 (d)

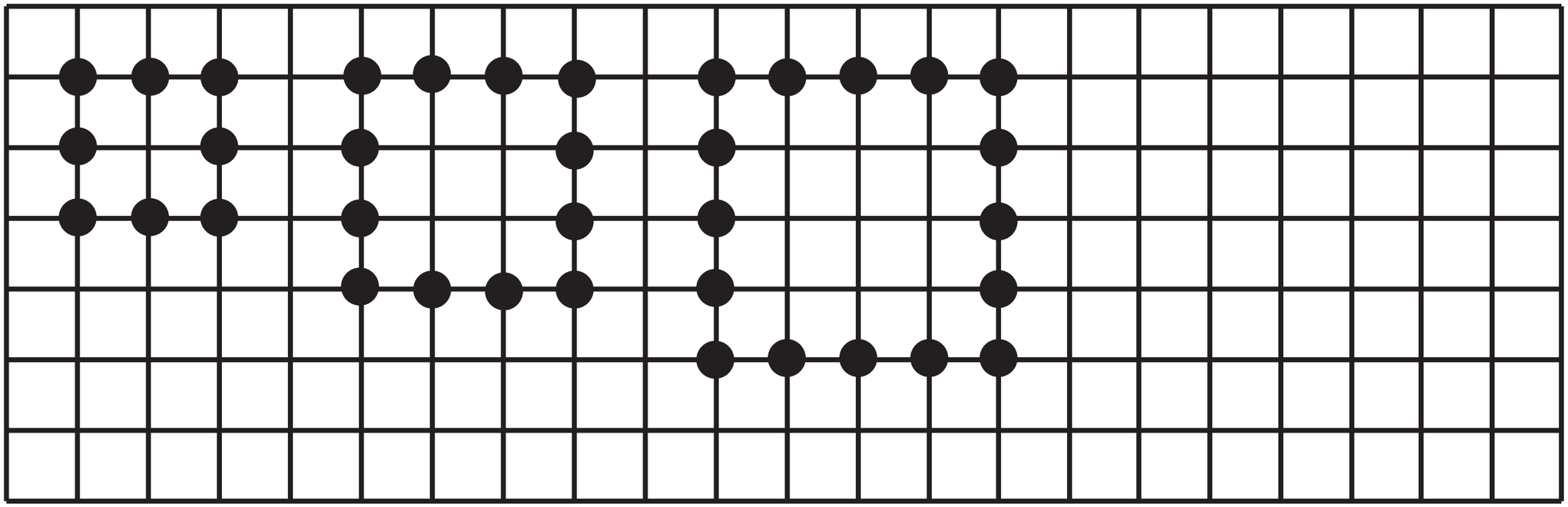


Question 4

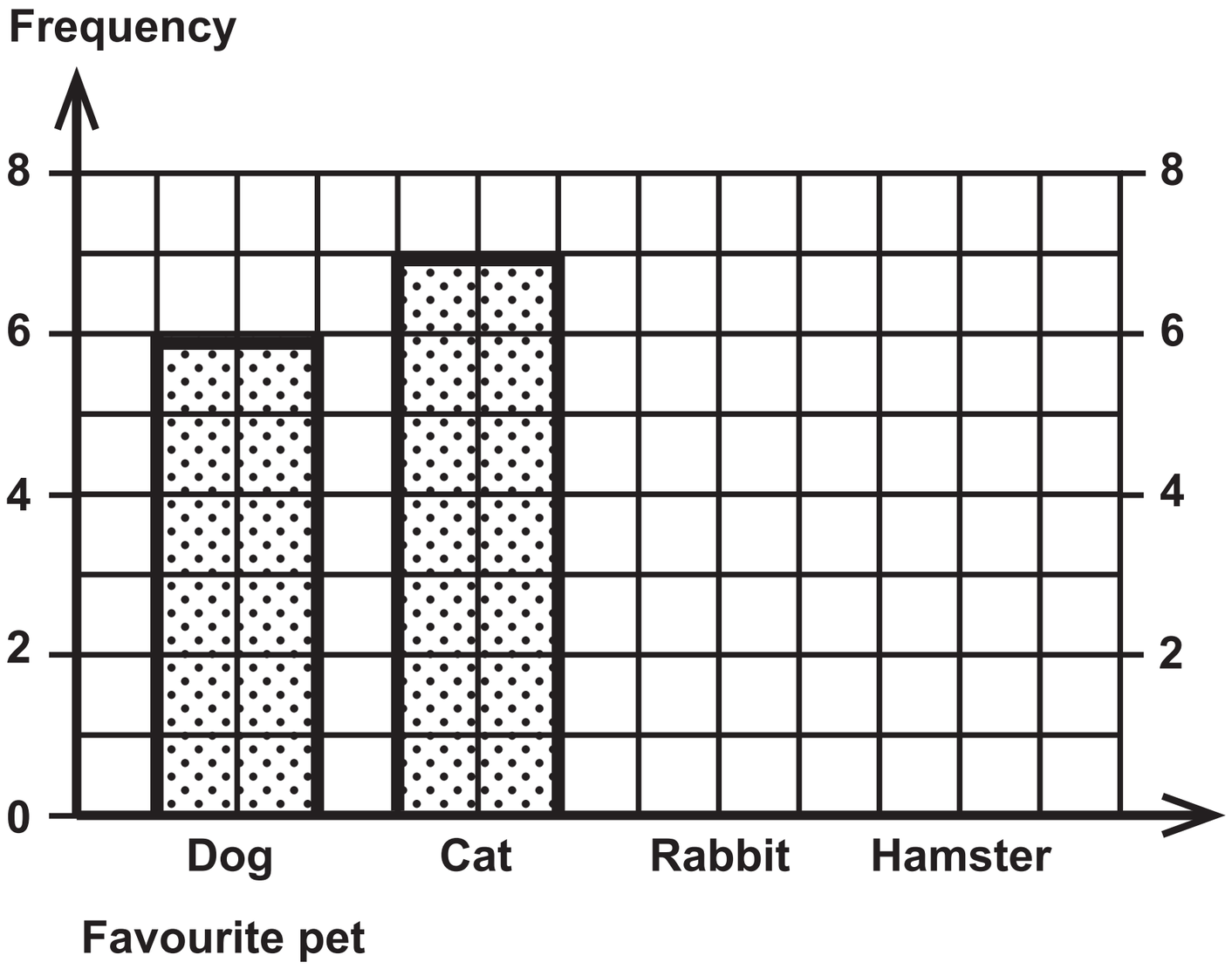


Question 5 (b) (i)

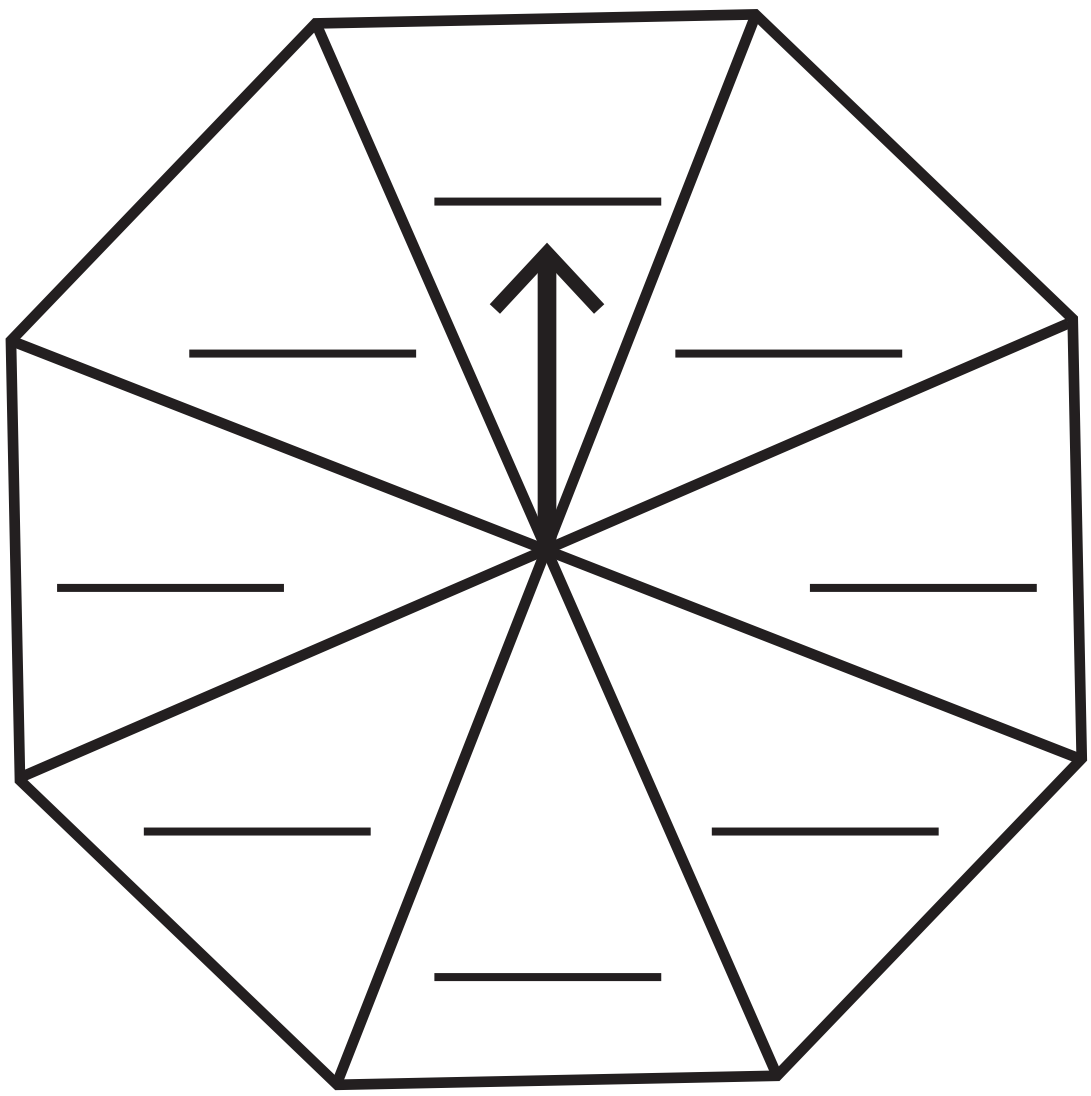
Diagram 1 Diagram 2 Diagram 3 Diagram 4



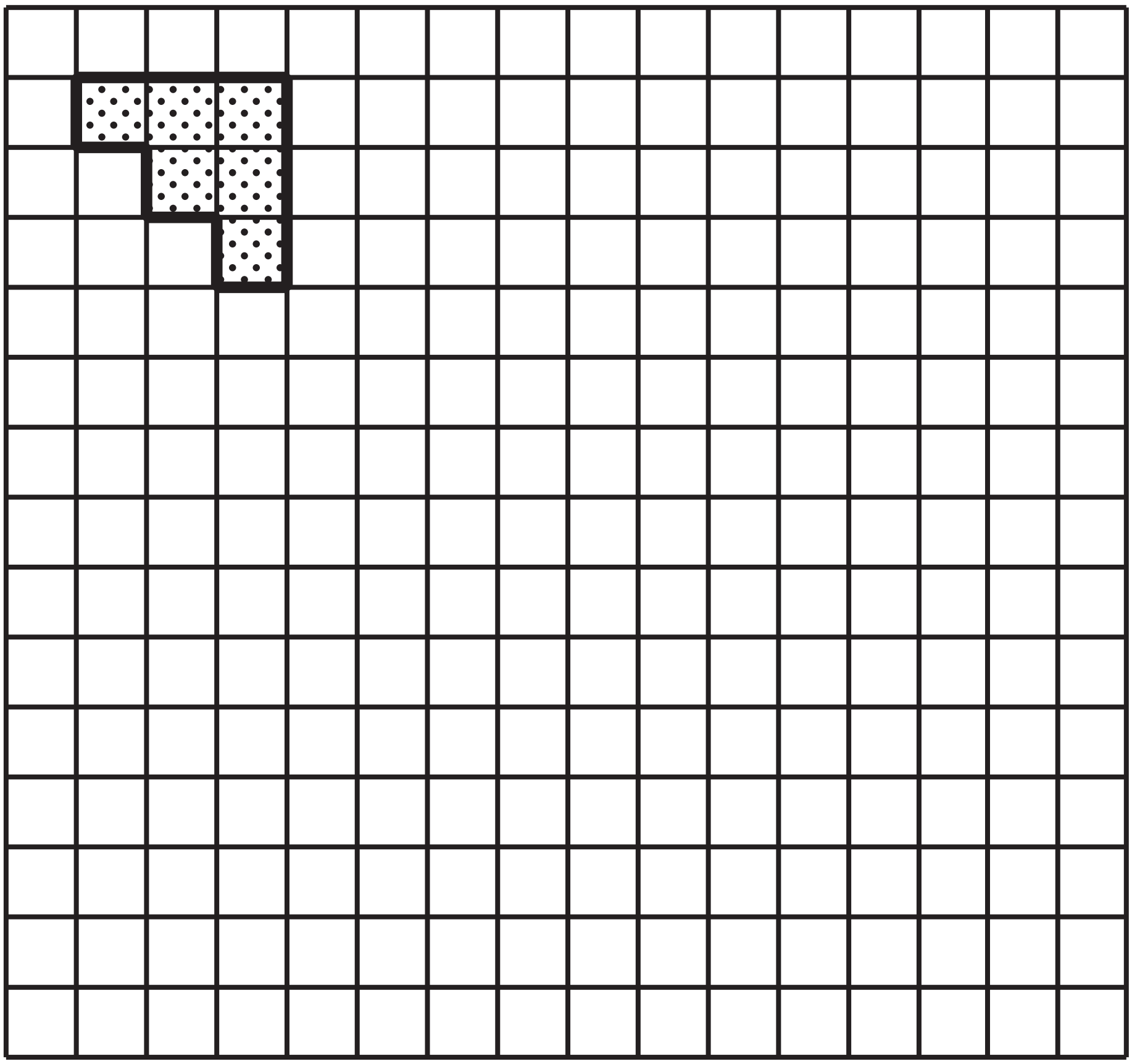
Question 6



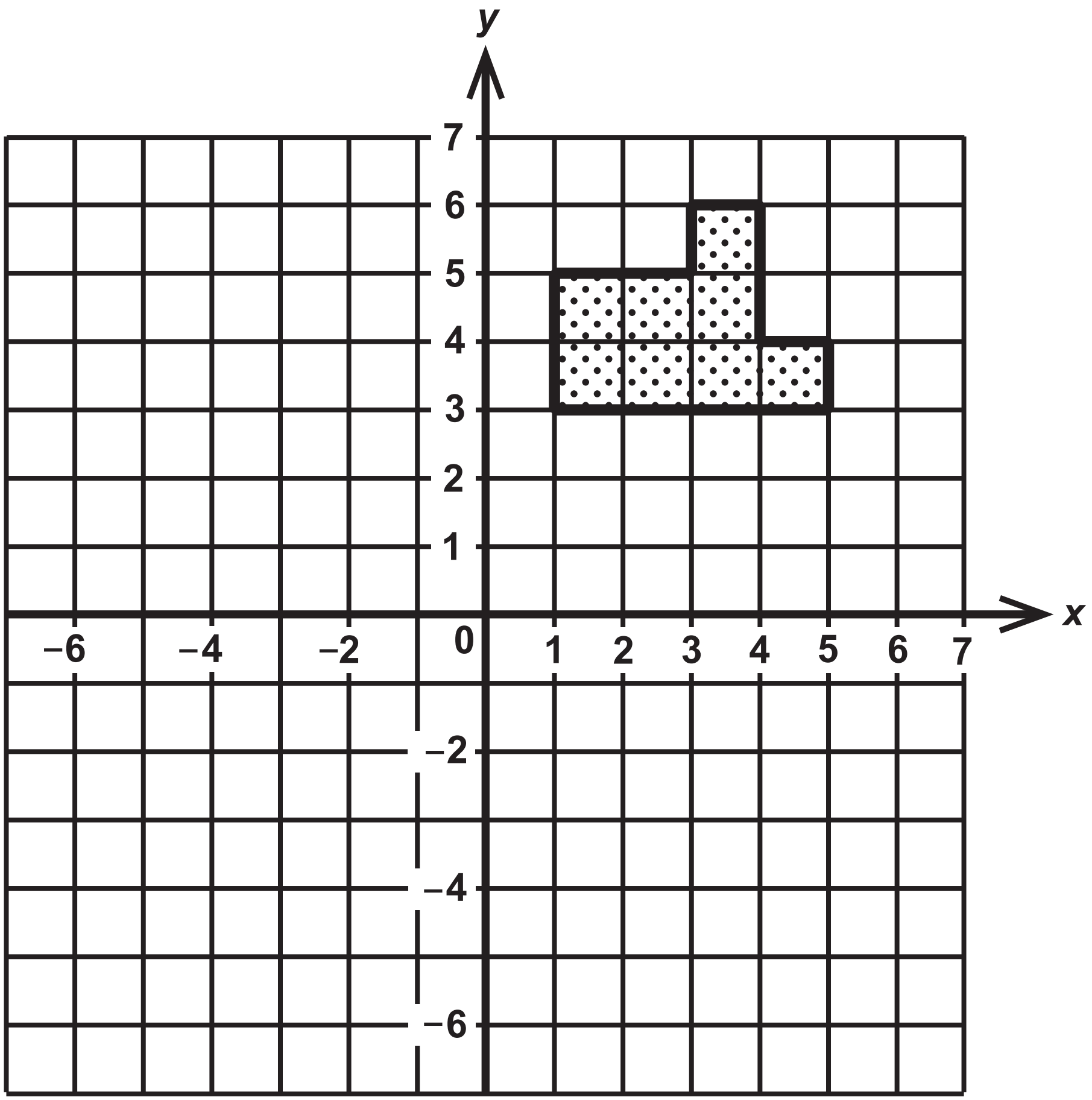
Question 10



Question 11 (a)

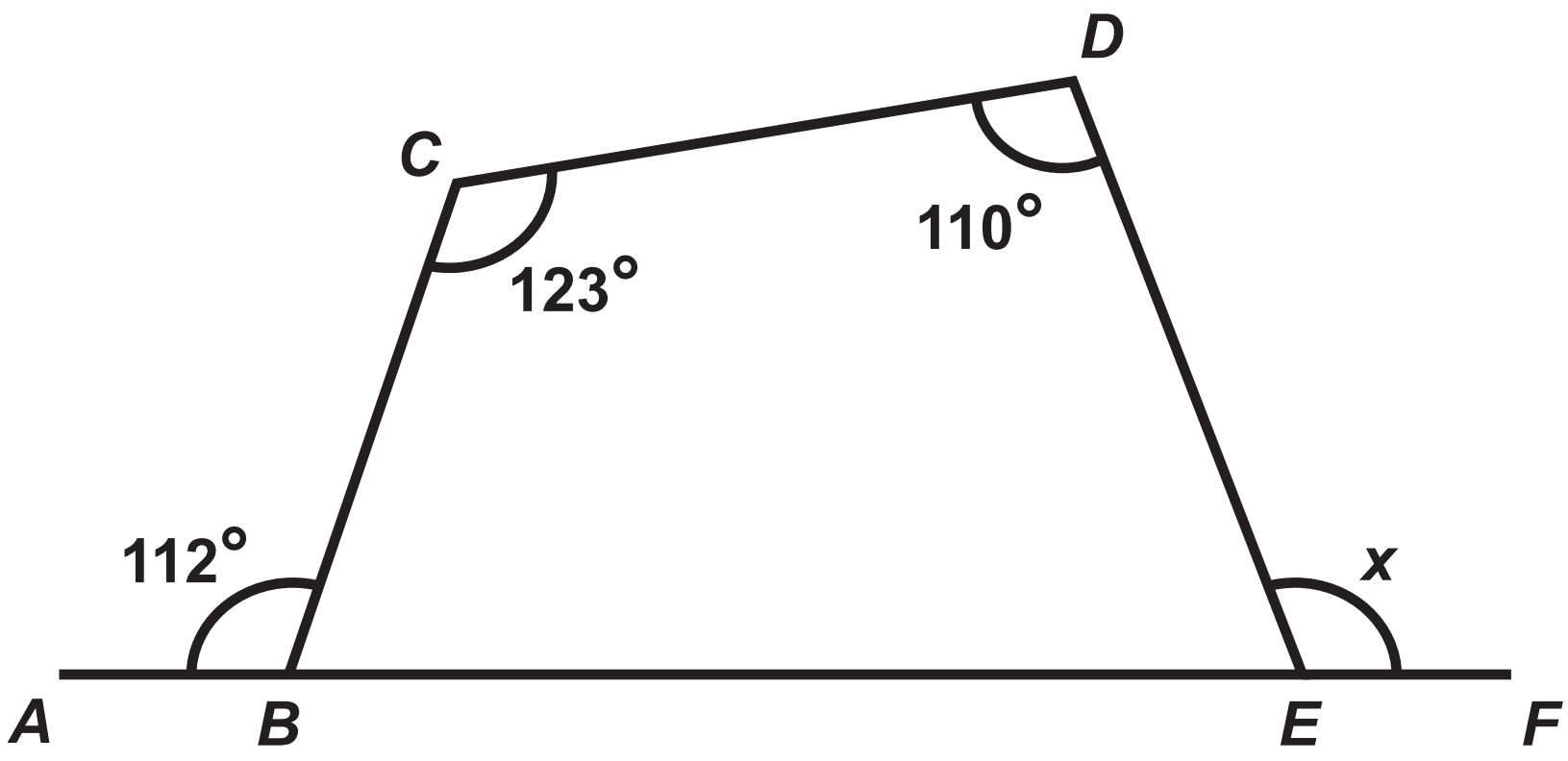


Question 11 (b)

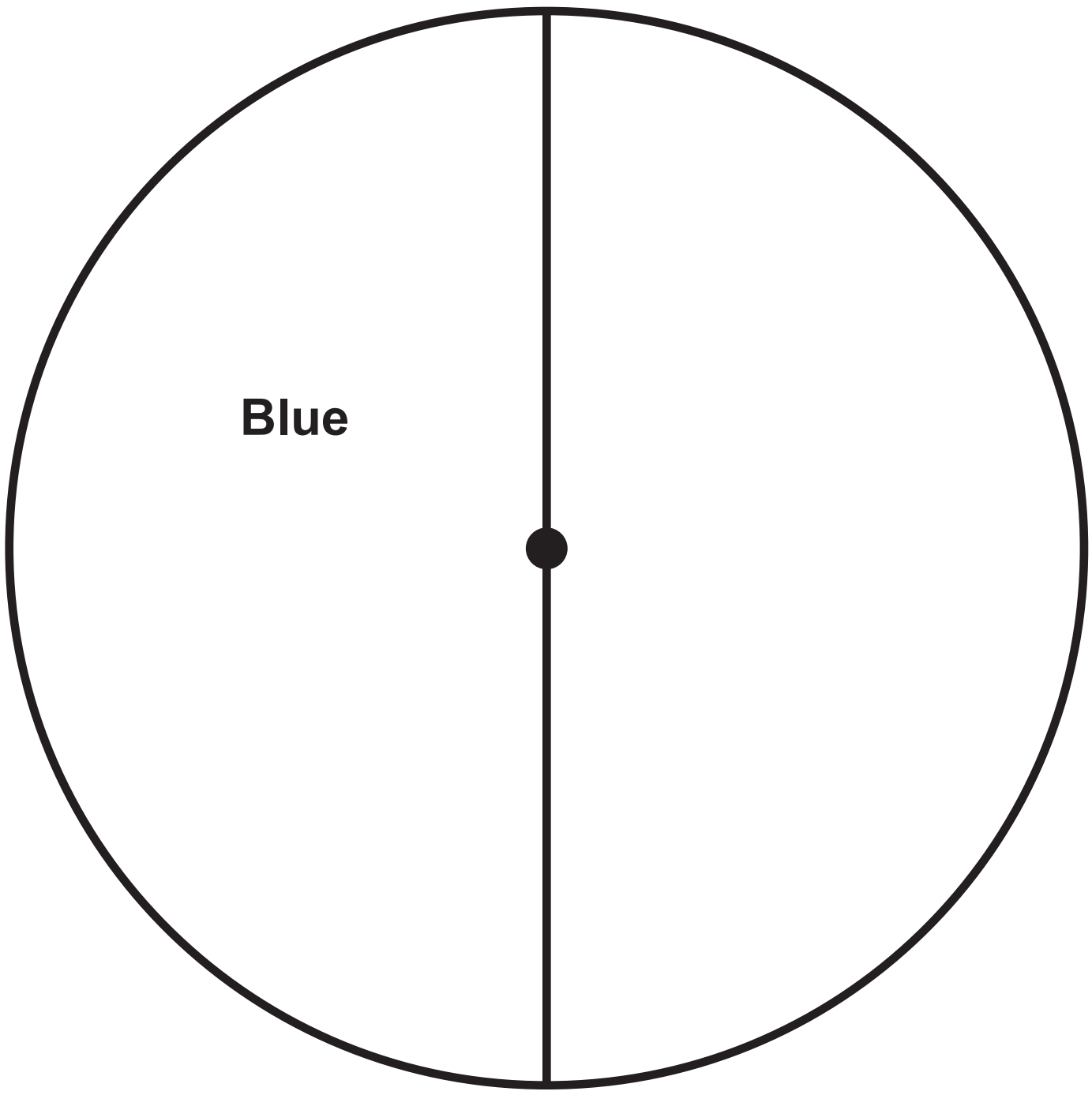


Question 12

Diagram NOT drawn to scale

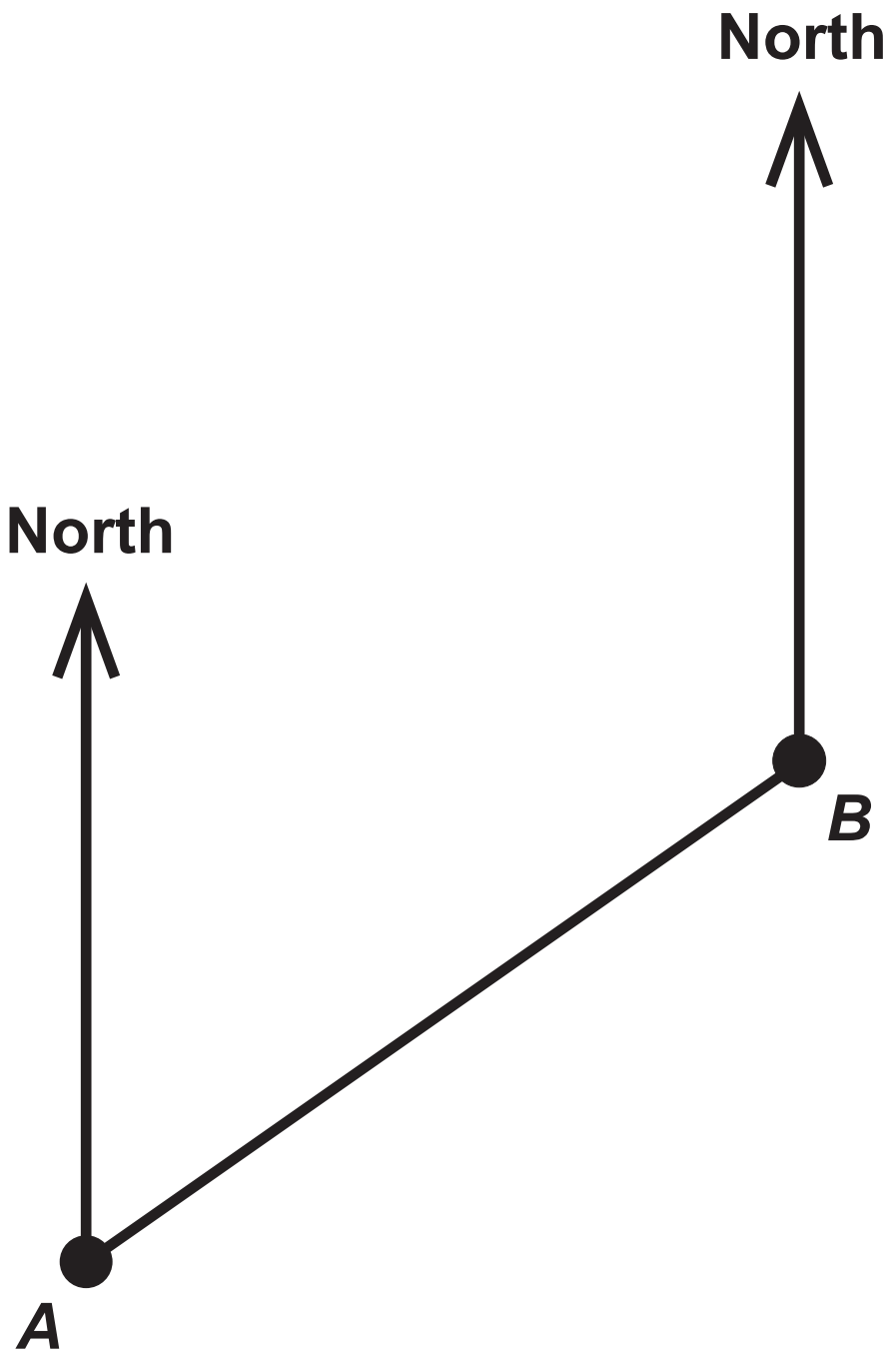


Question 13 (b)



Question 17

Scale: 1 cm represents 5 km



GCSE
MATHEMATICS
and
NUMERACY

FORMULA LIST
FOUNDATION TIER
GCSE

You must not write on these formula pages.

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

Formula List – Foundation Tier

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