



GCSE

3300U30-1

TUESDAY, 24 MAY 2022 – MORNING

MATHEMATICS

UNIT 1: NON – CALCULATOR

INTERMEDIATE TIER

**1 hour 35 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.	4	
2.	3	
3.	4	
4.	3	
5.	4	
6.	3	
7.	5	
8.	6	
9.	3	
10.	4	
11.	5	
12.	6	
13.	2	
14.	6	
15.	4	
16.	4	
17.	2	
18.	2	
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.

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

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

(Turn over)

1. Calculate each of the following.

(a) $3^2 \times 2^3$

[2 marks]

continued on the next page . . .

(Turn over)

Question 1 continued

1. (b) $-124 \div 4$

[1 mark]**continued on the next page . . .****(Turn over)**

Question 1 continued**1. (c) 15% of 280**

[1 mark]**(Turn over)**

8

2. Write 0.3, $\frac{8}{25}$ and 31%

in ascending order.

You must show all your working.

Smallest value

Greatest value

[3 marks]

(Turn over)

- 3. Look at the diagram for Question 3 in the separate Diagram Booklet. The diagram is NOT drawn to scale.**

The diagram shows triangle ABC and triangle CBD .

In the diagram:

$$\mathbf{CB = CD}$$

Angle ACB is a right angle.

An angle of 220° is shown on the diagram.

$$\mathbf{Angle\ CDB = x.}$$

continued on the next page . . .

(Turn over)

Question 3 continued

Calculate the size of angle x .

You must show all your working.

(Turn over)

11

$x =$ _____^o

[4 marks]

(Turn over)

4. Imran is 9 years older than Glyn.

Glyn is twice as old as Sheila.

The sum of the three ages

is 49 years.

How old are Imran, Glyn and Sheila?

Imran = _____ years old.

Glyn = _____ years old.

Sheila = _____ years old.

[3 marks]

(Turn over)

5. (a) Find a whole number value of n ,
so that $7n - 9$ is a multiple of 4
You must show all your working.

When $n =$ _____, $7n - 9$ is a
multiple of 4

[2 marks]

(Turn over)

Question 5 continued

- 5. (b) Find a whole number value of n , so that $3n - 5$ is a prime number.**

You must show all your working.

(Turn over)

When $n =$ _____, $3n - 5$ is a
prime number.

[2 marks]

(Turn over)

6. (a) A bag contains red balls, green balls and yellow balls. The number of green balls is equal to the number of yellow balls.

Mali picks one ball from the bag at random.

The probability that she will pick a red ball is 0.3

Find the probability that Mali will pick a yellow ball.

[2 marks]

continued on the next page . . .

(Turn over)

Question 6 continued

**6. (b) A different bag contains
10 balls.**

**Some of the balls in the bag
are blue.**

All the other balls are white.

**Morgan picks a ball from the
bag at random.**

He says,

**The probability that I will pick a
blue ball from the bag is 0.25**

**Explain why Morgan cannot
be correct.**

(Turn over)

20

[1 mark]

(Turn over)

7. Solve each of the following equations.

(a) $4y - 3 = 15$

[2 marks]

continued on the next page . . .

(Turn over)

Question 7 continued

7. (b) $8x - 38 = 17 - 3x$

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)

23

[3 marks]

(Turn over)

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

**Look at the diagrams for
Question 8 in the separate
Diagram Booklet.**

**The diagrams are NOT drawn
to scale.**

**The diagrams show a rectangle
and a trapezium.**

continued on the next page . . .

(Turn over)

Question 8 continued

The area of the rectangle = 48 m^2

**The width of the rectangle is
represented by x .**

**The height of the trapezium is
twice the width of the rectangle.**

**Calculate the area of the trapezium.
You must show all your working.**

(Turn over)

[illegible]

(Turn over)

[4 marks + 2 marks OCW]

(Turn over)

9. Write down four whole numbers so that:

- **they are all between 1 and 15 inclusive**
- **they have a mode of 7**
- **they have a median value of 8.5**
- **their mean is 9**

Write your numbers in the boxes on page 30.

(Turn over)

[illegible]

(Turn over)

30

[3 marks]

(Turn over)

10. The diagram below shows a straight line, ABC .

The diagram is NOT drawn to scale.



ABC is a straight road, where the ratio $AB : BC = 3 : 4$

$AC = 56$ km.

Calculate the length of BC .

Give your answer in MILES.

You must show all your working.

(Turn over)

This image shows a single page from a notebook or ledger. It features ten evenly spaced horizontal black lines running across the width of the page. The lines are thin and uniform, providing a guide for writing. There are no margins, text, or other markings present on the page.

(Turn over)

Length of *BC* = _____ MILES
[4 marks]

11. Look at the table for Question 11 in the separate Diagram Booklet. The table shows some of the values of $y = x^2 + x - 4$ for values of x from -3 to 3

(a) Complete the table by finding the values of y for $x = -1$ and for $x = 1$

[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**
- $$y = x^2 + x - 4$$
- for values of x from -3 to 3**

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

Question 11 continued

11. (c) Use your graph to solve the equation $x^2 + x - 4 = 0$

Give your answers correct to 1 decimal place.

$x =$ _____ or $x =$ _____

[1 mark]

(Turn over)

12. Look at Diagram 1 and Diagram 2 for Question 12 in the separate Diagram Booklet.

Diagram 1 is a pie chart and Diagram 2 is a bar chart.

The children in year 5 and year 6 in a primary school took part in a survey. The children were asked, “How many pets do you have?”

The results for year 5 are shown in the pie chart.

The results for year 6 are shown in the bar chart.

continued on the next page . . .

(Turn over)

Question 12 continued

No child in either year had more than 5 pets.

There are 36 children in year 5

One child is chosen at random from all the children in year 5 and year 6

What is the probability that this child has no more than 1 pet?

(Turn over)

[illegible]

(Turn over)

40

[6 marks]

(Turn over)

13. Write down an expression for the n th term of the following sequence.

15, 9, 3, -3 , ...

[2 marks]

(Turn over)

14. Look at the diagram for Question 14 in the separate Diagram Booklet. The diagram is an incomplete tree diagram.

A and B are independent events.

The probability of event A occurring is 0.6

The probability of event A AND event B occurring is 0.48

(a) Complete the tree diagram.

(Turn over)

[4 marks]

**14. (b) Calculate the probability of
neither event A nor event B
occurring.**

(Turn over)

[2 marks]

(Turn over)

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

In the diagram:

- **AB and ED are parallel**
- **triangles ABC and DEC are similar**
- **$BC = 8$ cm**
- **$CA = 10$ cm**
- **$CD = 15$ cm**
- **$DE = 10.5$ cm**

(a) Calculate the length of CE .

(Turn over)

[2 marks]

continued on the next page . . .

(Turn over)

Question 15 continued

15. (b) Calculate the length of AB .

[2 marks]

(Turn over)

16. Solve the following simultaneous equations using an algebraic (not graphical) method.

You must show all your working.

$$2x + 3y = 29$$

$$5x - 4y = -8$$

(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]

(Turn over)

17. Circle the correct answer for each of the following statements.

(a) 7.2 m^3 is equal to

720 cm^3
72000 cm^3
$7.2 \times 10^5 \text{ cm}^3$
$7.2 \times 10^3 \text{ cm}^3$
$7.2 \times 10^6 \text{ cm}^3$

[1 mark]

continued on the next page . . .

(Turn over)

Question 17 continued

17. (b) $36^{\frac{1}{2}}$ is equal to

18	6	$\frac{1}{18}$	$\frac{1}{6}$	$\frac{1}{36}$
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[1 mark]

(Turn over)

18. Find the value of $\frac{30\,000}{1.5 \times 10^5}$

Write your answer as a decimal.

[2 marks]

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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[illegible]

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MATHEMATICS

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INTERMEDIATE TIER

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and sent for marking.**

Diagram Booklet

Surname: _____

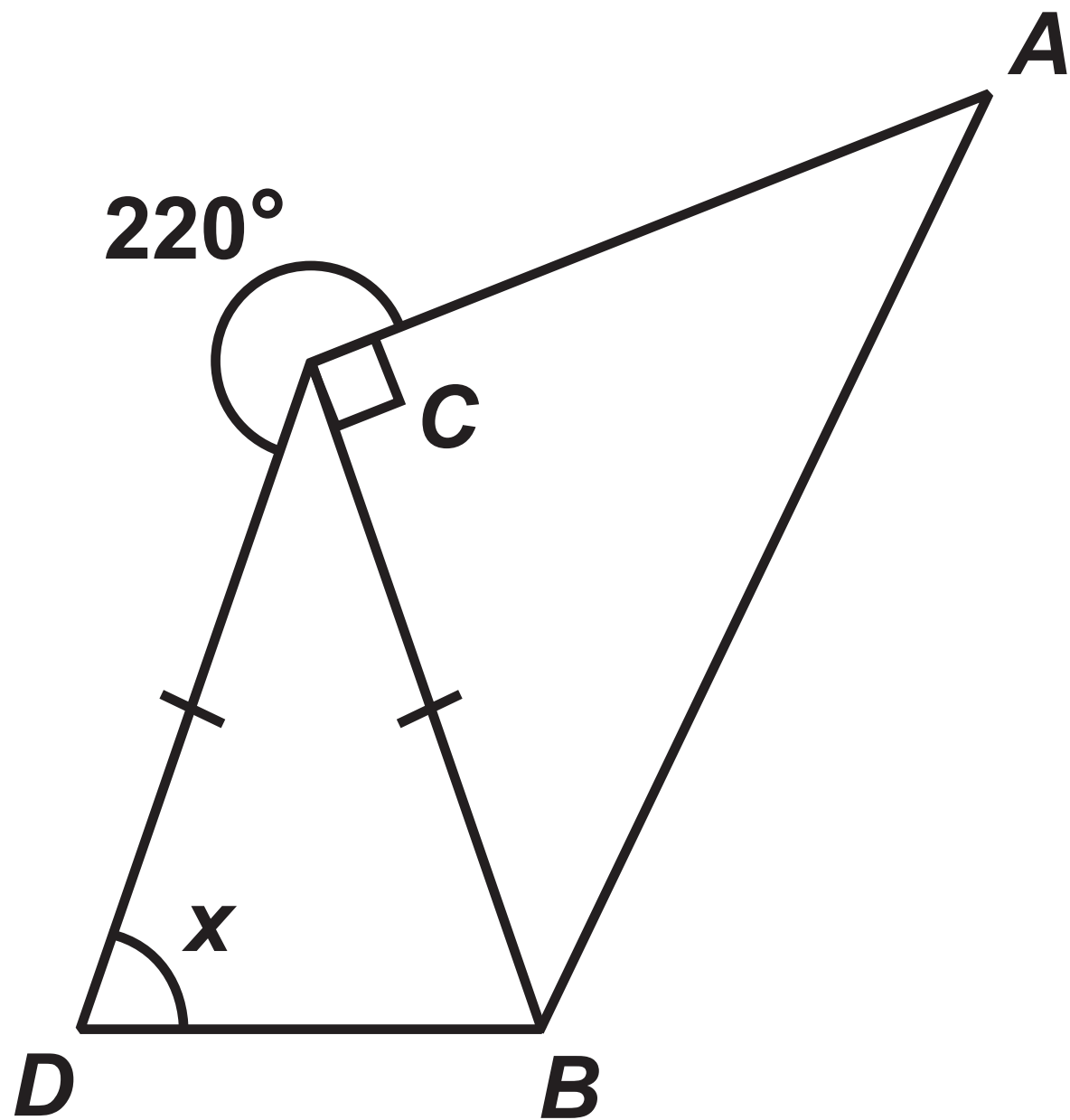
First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

Question 3

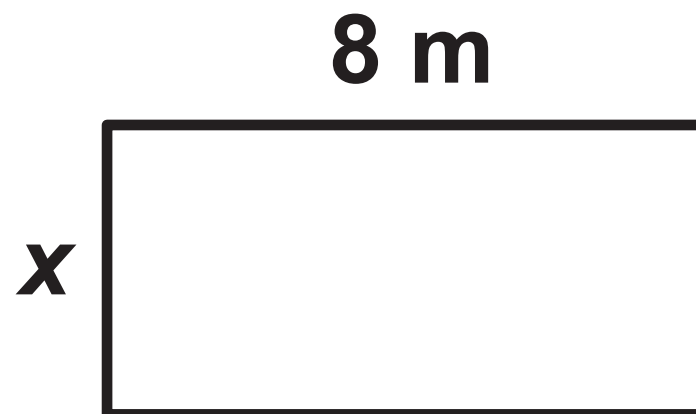
Diagram NOT drawn to scale



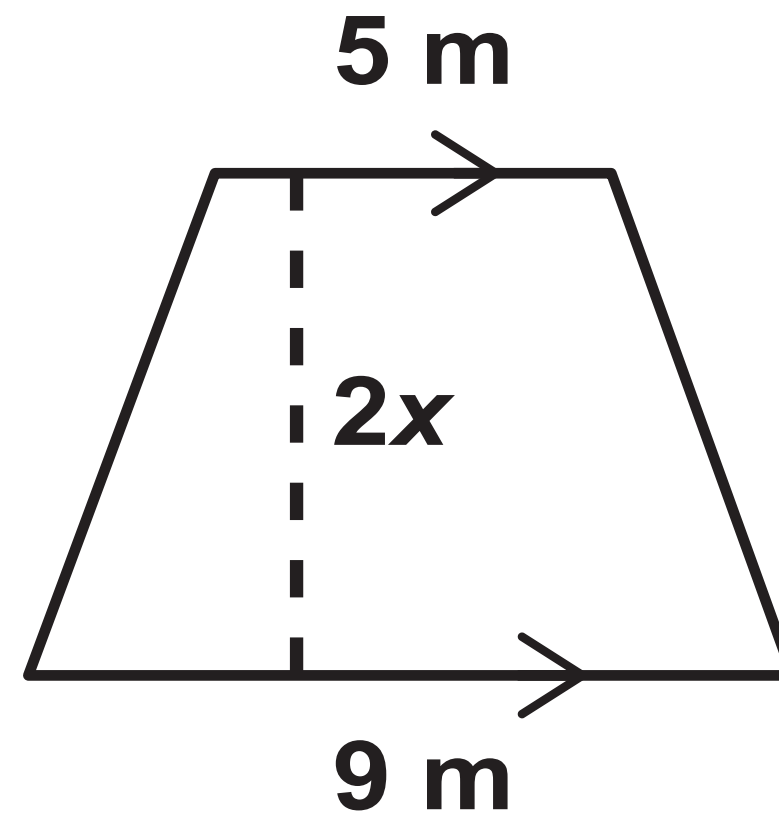
Question 8

Diagrams NOT drawn to scale

Rectangle



Trapezium

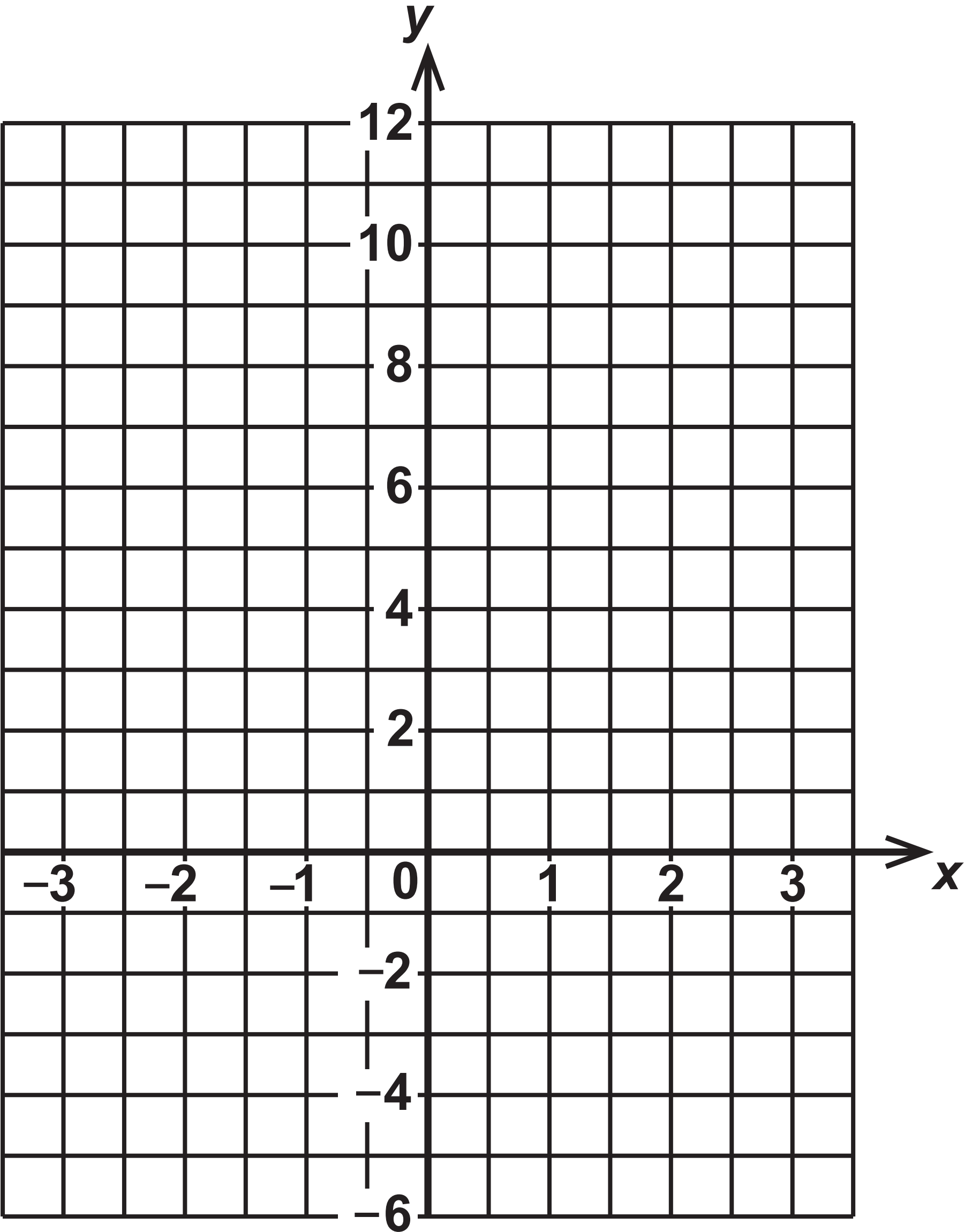


Question 11

Table

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

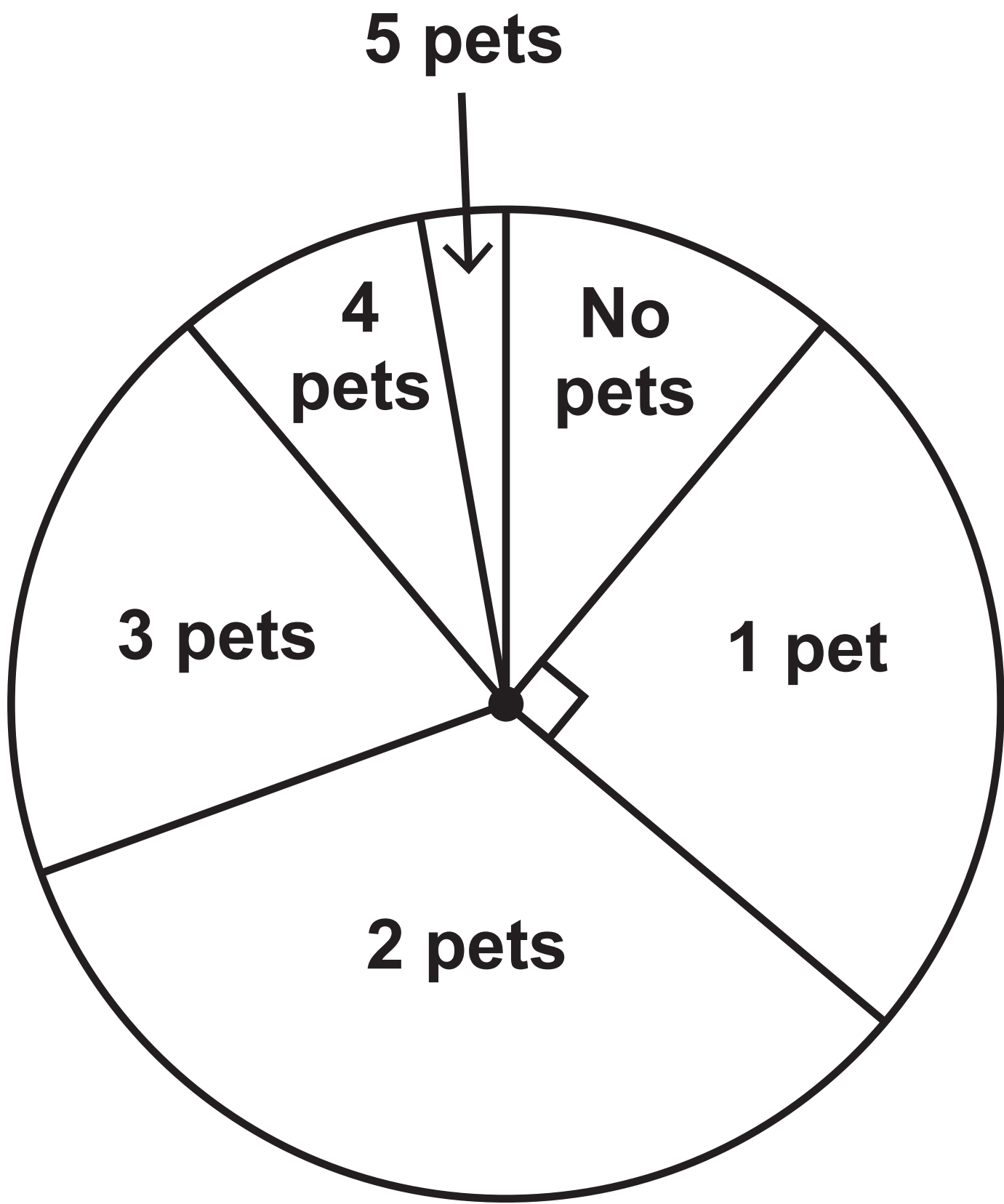
Question 11 (b)



Question 12

Diagram 1

YEAR 5

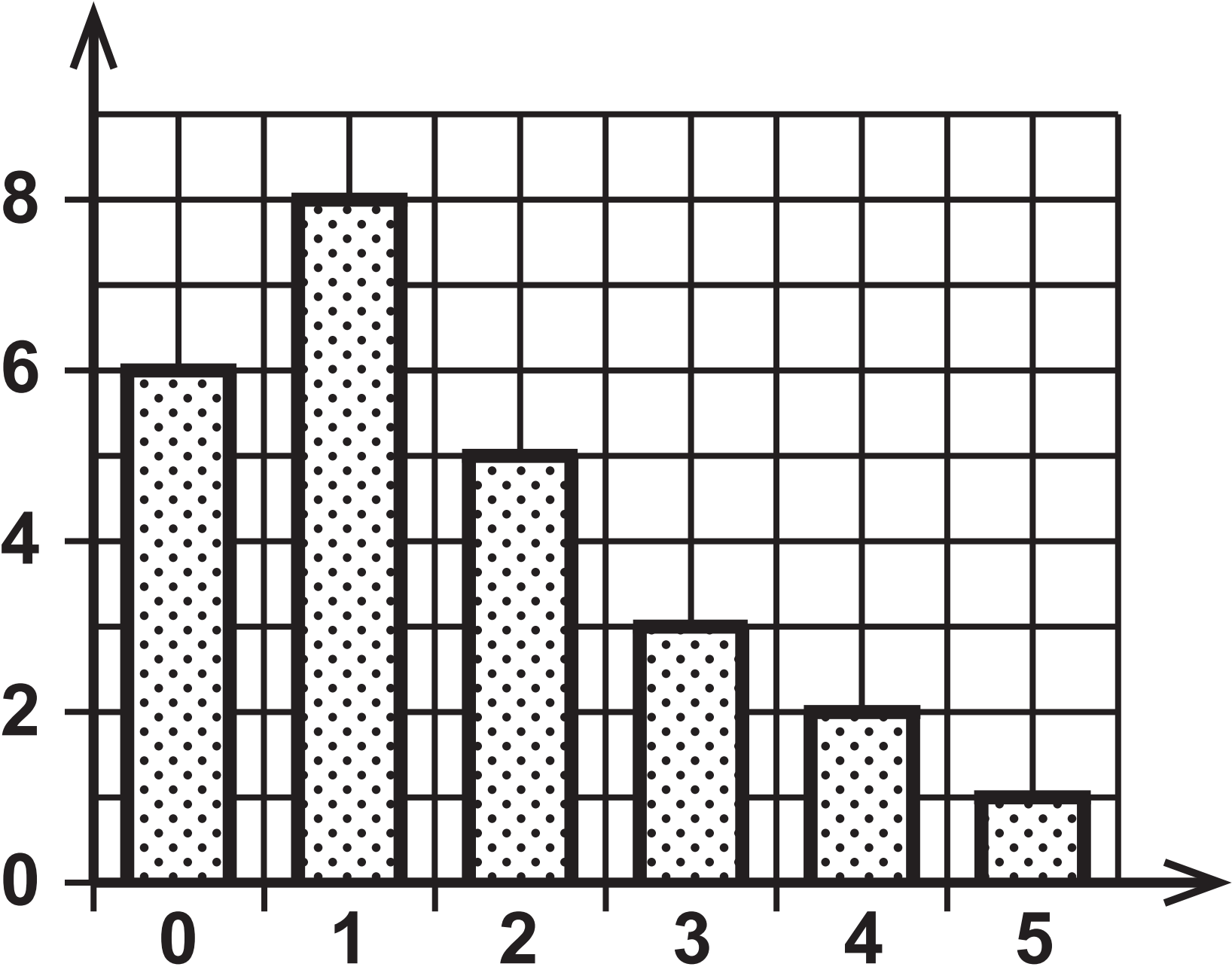


Question 12

Diagram 2

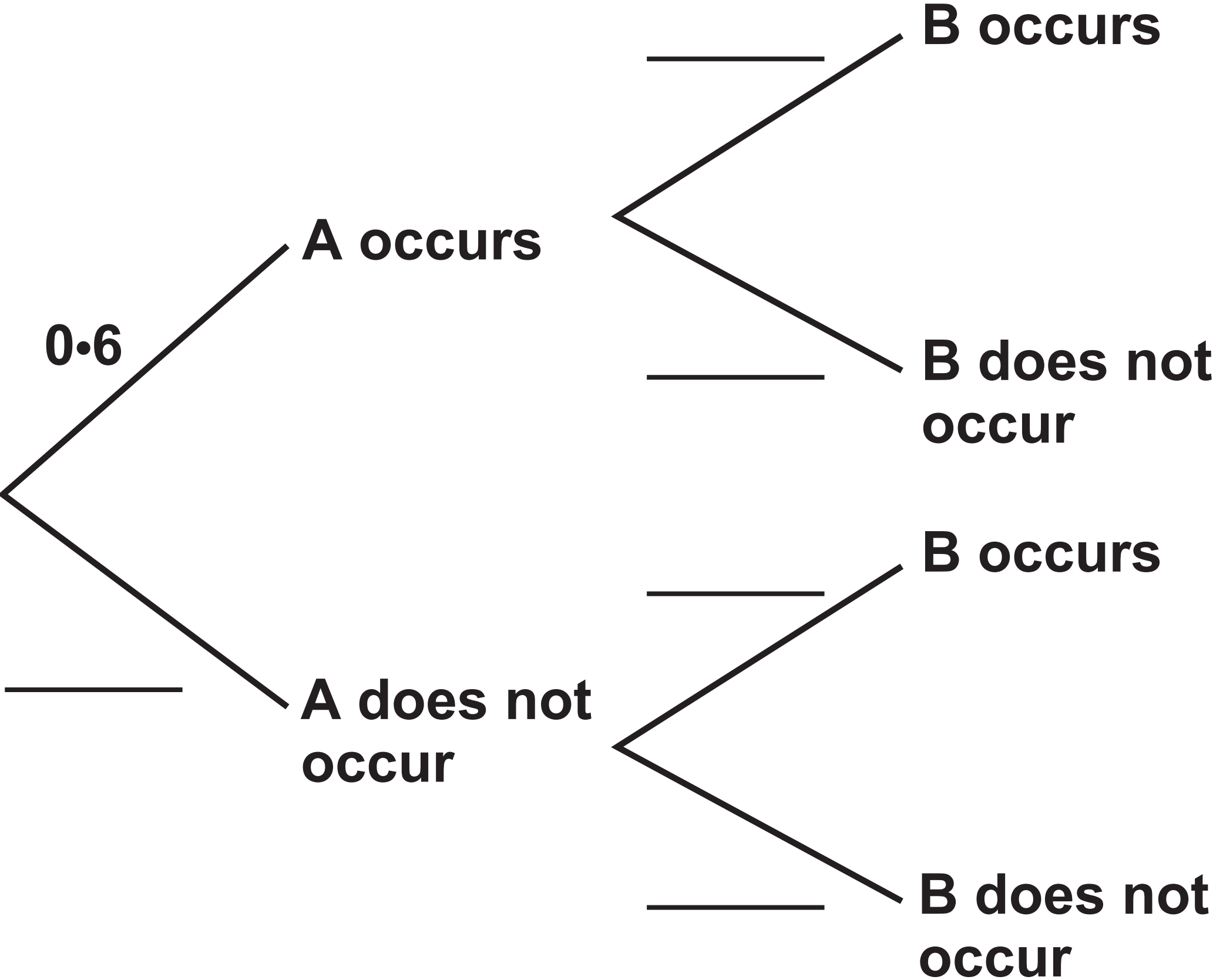
YEAR 6

Frequency



Number of pets

Question 14



**GCSE
MATHEMATICS
and
NUMERACY**



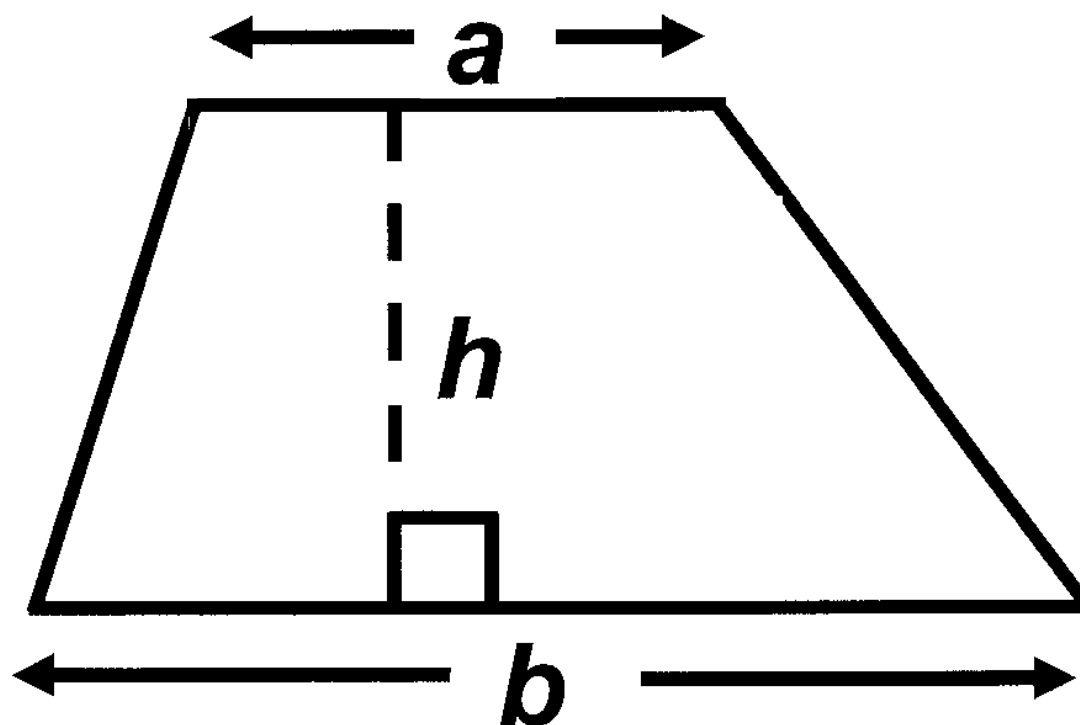
**FORMULA LIST
INTERMEDIATE TIER
GCSE**

You must not write on these formula pages.

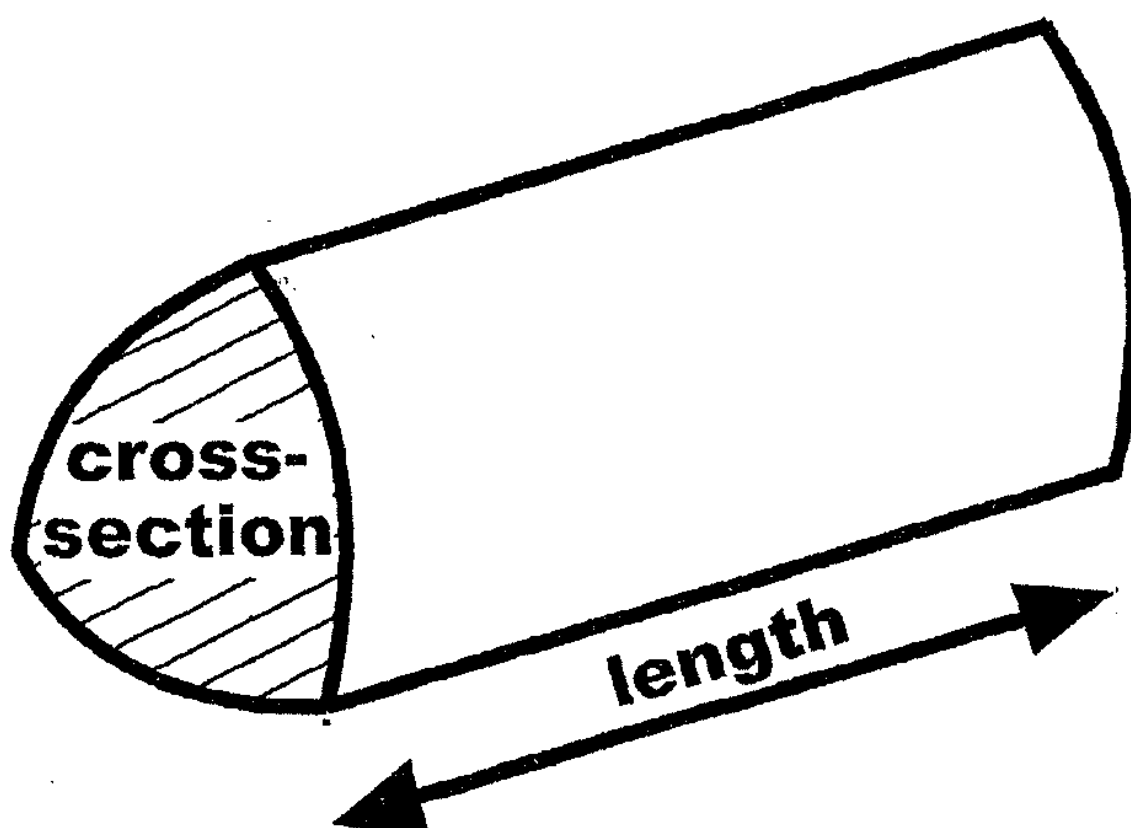
Anything you write on these formula pages will gain NO credit.

Formula List – Intermediate Tier

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



Volume of prism =
area of cross – section $\times$ length



Question 15

Diagram NOT drawn to scale

