SECONDARY SCHOOLS ANNUAL EXAMINATIONS - 2001

Educational Assessment Unit - Education Division

FORM 3 **MATHEMATICS (MENTAL)** **TIME: 15 minutes**

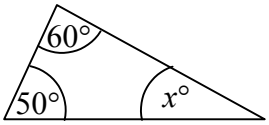
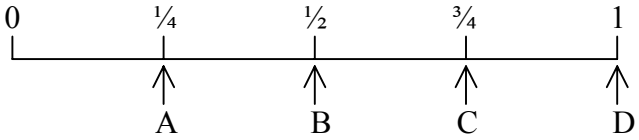
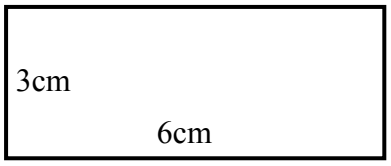
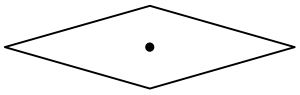
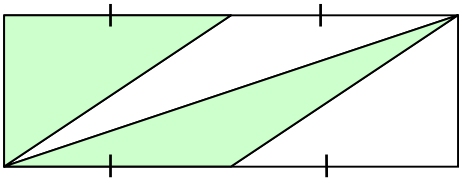
Name _____

Class _____

Mark

- **ANSWER ALL QUESTIONS.**
- **EACH QUESTION CARRIES 1 MARK.**
- **CALCULATORS, RULERS, PROTRACTORS AND OTHER MATHEMATICAL INSTRUMENTS ARE NOT ALLOWED.**
- **WRITE DOWN YOUR ANSWER ONLY IN THE SPACE PROVIDED.**

DO NOT WRITE IN THIS SPACE

	QUESTION	ANSWER
1.	Write 37.289 correct to three significant figures.	_____
2.	Which of the following is an approximate value for $\sqrt{66}$? A) 33 B) 9 C) 8 D) 11	_____
3.	Write 427.3 in standard form.	_____
4.	Write down the value of x. 	_____
5.	An ordinary six sided dice is thrown. Which arrow marked on the probability scale below shows the probability of throwing an **even** number?  	_____
6.	The diagram shows a sketch of a rectangular school yard. What is the **actual** length of the yard? Scale: 1cm = 10m 	_____
7.	Write down the order of rotational symmetry. 	_____
8.	Express ¼ as a percentage.	_____
9.	Write down the value of $3x - 4$ when $x = 4$.	_____
10.	What fraction of the rectangle shown is shaded? 	_____

SECONDARY SCHOOLS ANNUAL EXAMINATIONS 2001

Educational Assessment Unit - Education Division

FORM 3 **MATHEMATICS (Main Paper)** **TIME: 1 h 45 min**

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total Main	Mental	**Global Mark**
Mark																		

DO NOT WRITE ABOVE THIS LINE

Name _____

Class _____

CALCULATORS ARE ALLOWED BUT ALL NECESSARY WORKING MUST BE SHOWN

ANSWER ALL QUESTIONS.

1. (a) Fill in the missing number:

(i) $8 - 5 =$ ☐ (ii) $4 - (-3) =$ ☐ (iii) $2^4 =$ ☐

(b) Write as a single number in index form: $4^3 \times 4^5 =$ ☐

_____(4 marks)

2.

The jacket shown has a marked price of Lm43.
How much does Andrew pay during the sale?

_____(4 marks)

3. Work out, giving your answer as a mixed number:

$$4\frac{7}{10} + 3\frac{2}{5}$$

_____(4 marks)

4. Solve the equation

$$5x + 4 = 18 - 2x$$

_____(4 marks)

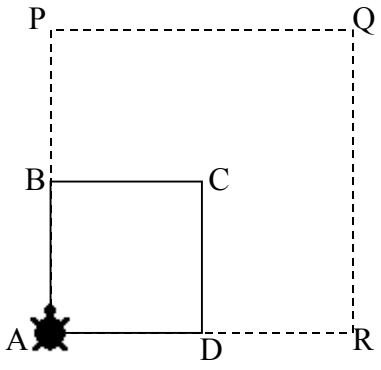
5. The square ABCD was drawn by using a set of LOGO commands. The drawing started at A and the turtle faced the direction shown.

(a) Complete the following repeat statement to draw the square ABCD.

REPEAT ____ [FD 50 RT ____]

(b) The area of square APQR is **four** times the area of square ABCD.
Complete the following repeat statement to draw the square APQR.

REPEAT ____ [FD ____ RT 90]



_____(4 marks)

6.

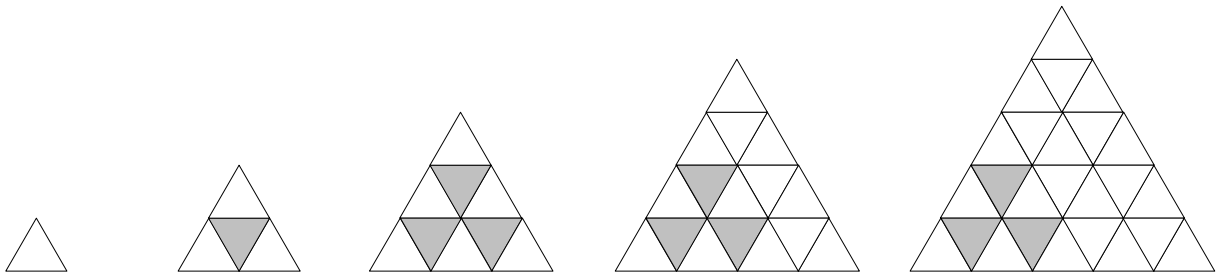


Diagram 1 Diagram 2 Diagram 3 Diagram 4 Diagram 5

(a) Shade 3 triangles in diagram 4 to continue the pattern.
(b) Shade 7 triangles in diagram 5 to continue the pattern.
(c) Fill in the missing numbers in the following table:

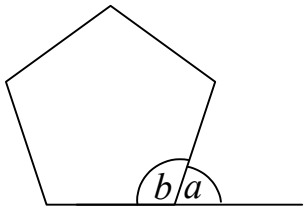
Diagram Number	1	2	3	4	5
Total number of triangles	1	4	9		

(d) The sequence on the right gives the number of **unshaded** triangles in each diagram. Write down the next two numbers in the sequence.

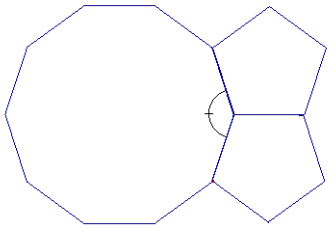
1, 3, 6, _____, _____.

(6 marks)

7. (a) The diagram shows a regular pentagon. Work out the size of:
(i) Each exterior angle, marked *a*.
(ii) Each interior angle, marked *b*.

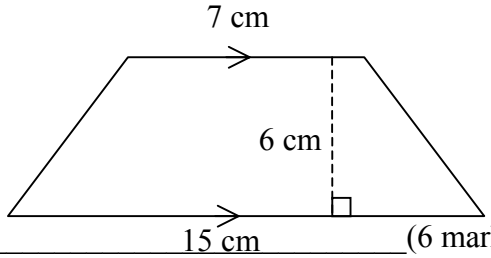


(b) The diagram shows a regular decagon (10 sides) and two regular pentagons (5 sides).
Work out the size of the marked angle.



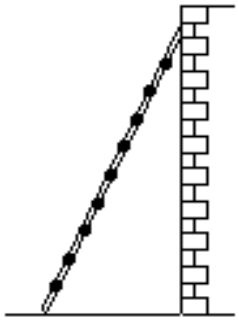
(6 marks)

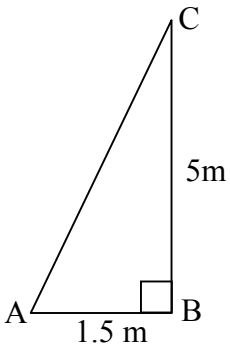
8. Work out the area of the trapezium shown.



(6 marks)

9. The diagram on the left shows a ladder resting on horizontal ground against a vertical wall. Use the diagram on the right to work out the length of the ladder. Give your answer correct to three significant figures.



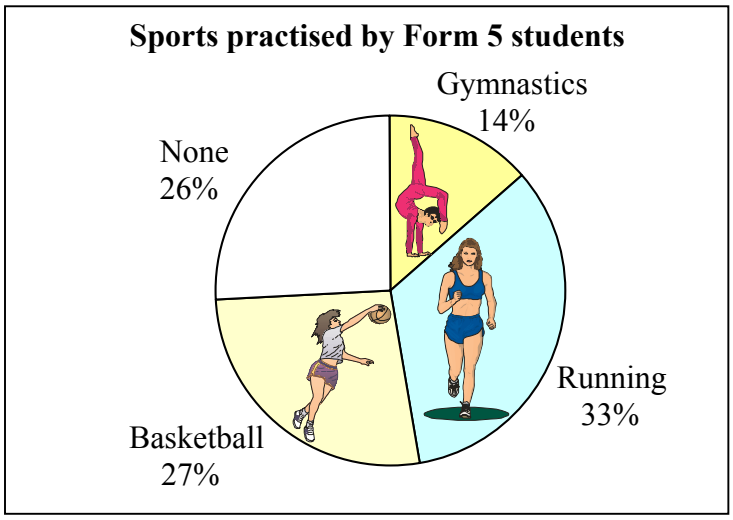


_____(6 marks)

10. A P.E. teacher carried out a survey at her school to find out what type of sport students practised after school, in each form. She asked one of the students, Sandra, to collect the information from form 5 students. Sandra used a computer spreadsheet to show the results of her survey in the pie chart shown on the right.

(a) Which sport was most popular with form 5 students?

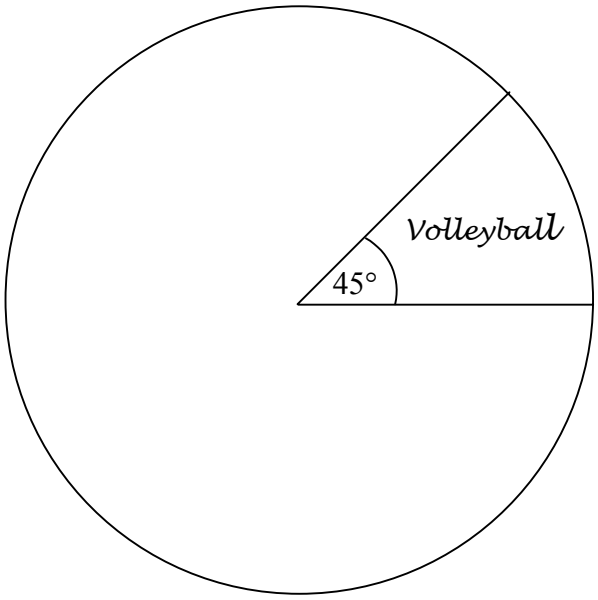
_____



(b) The P.E. teacher asked Paula to collect the information from form 2 students. As Paula did not know how to use a computer spreadsheet she had to show the information collected by drawing a pie chart by hand.

(i) Use the information below to **complete** the pie chart on the right. Label each sector as shown.

Volleyball	15 students
Gymnastics	30 students
Netball	50 students
None	25 students



(ii) Which sport was most popular with form 2 students?

_____

_____(6 marks)

11. (a) Martin cycles at an average speed of 15 km/h for 2 ½ hours. Work out the distance that Martin travels.

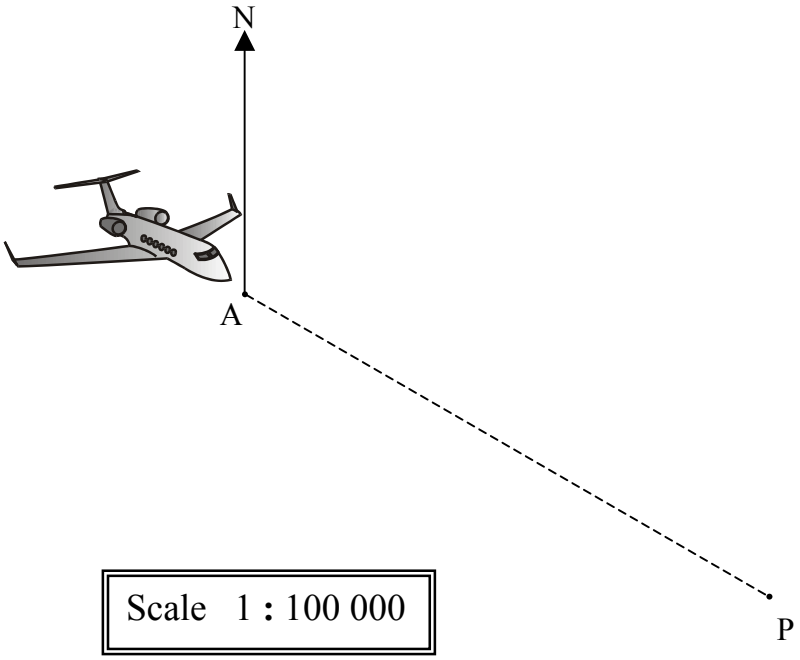
(b) The diagram shows the position of an aircraft at A.

(i) Use your protractor to measure and write down the three-figure bearing on which the aircraft must fly to reach the airport at P. _____ °

(ii) Measure and write down the distance between A and P. Give your answer in centimetres, correct to one decimal place.

_____ cm

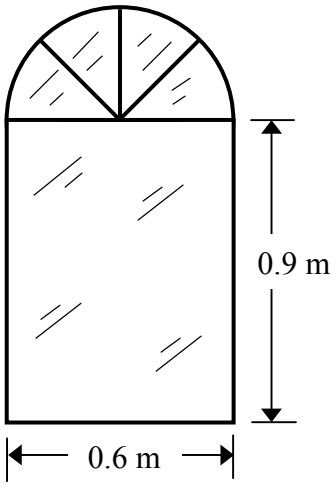
(iii) Use your answer in (ii) to work out the real distance of the aircraft from the airport, using the scale given. Give your answer in kilometres, correct to one decimal place.



_____(8 marks)

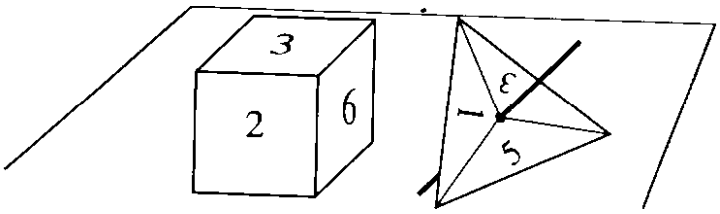
12. The diagram shows a metal frame for a window. The lower part is a rectangle and the upper part is a semi-circle.

Work out the **total** length of metal in the frame. Give your answer in metres, correct to 3 significant figures.



_____(8 marks)

13. The diagram shows a fair dice and a fair spinner. The dice is a cube with faces numbered 1, 2, 3, 4, 5 and 6. The triangular spinner is numbered 1, 3 and 5. The score shown on the dice is 3. The score shown on the spinner is 5.



(a) When the dice is thrown, what is the probability that the score is an **odd** number? _____

(b) The dice is thrown and the spinner is spun. The possibility space shown below shows the combination of scores on the dice and on the spinner. The first number is the score on the dice and the second number is the score on the spinner.
Complete the possibility space to show all the combinations.

		Score on dice					
		1	**2**	**3**	**4**	**5**	**6**
Score on spinner	1	**1**,1	**2**,1	**3**,1	**4**,1	**5**,1	**6**,1
	3	**1**,3	**2**,3	**3**,3	**4**,3		**6**,3
	5	**1**,5	**2**,5		**4**,5	**5**,5	

Use the possibility space to find the probability that:

(i) the **total** score on the dice and the spinner will be **2**

(ii) the **total** score on the dice and the spinner will be **6** _____

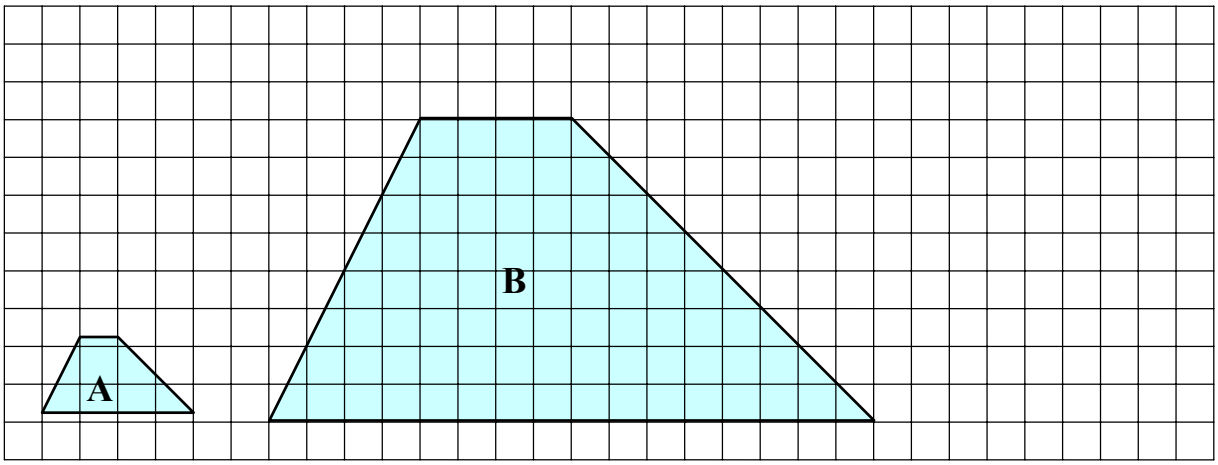
(iii) the **total** score on the dice and the spinner will be **greater** than **7** _____

(iv) the score on the dice and the spinner will be the **same**. _____

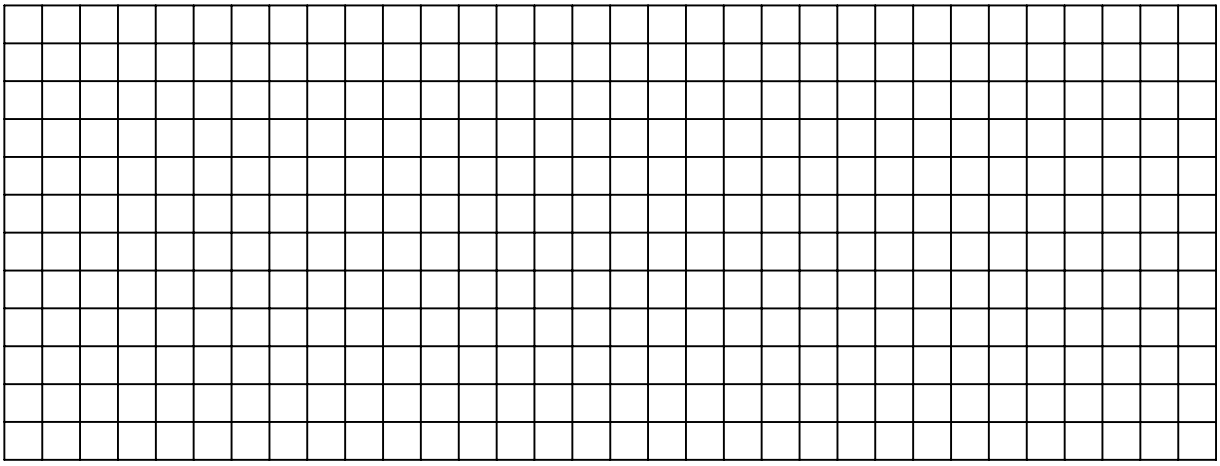
_____

_____(8 marks)

14.



(a) On the grid below, draw an enlargement of figure **A** using a scale factor of 3



(b) Figure **B** is an enlargement of figure **A**. Find the scale factor.

_____(8 marks)

15. The equation of a line is $y = 2x - 1$.
(a) Work out the value of y when $x = 0$. (b) Work out the value of y when $x = 2$.

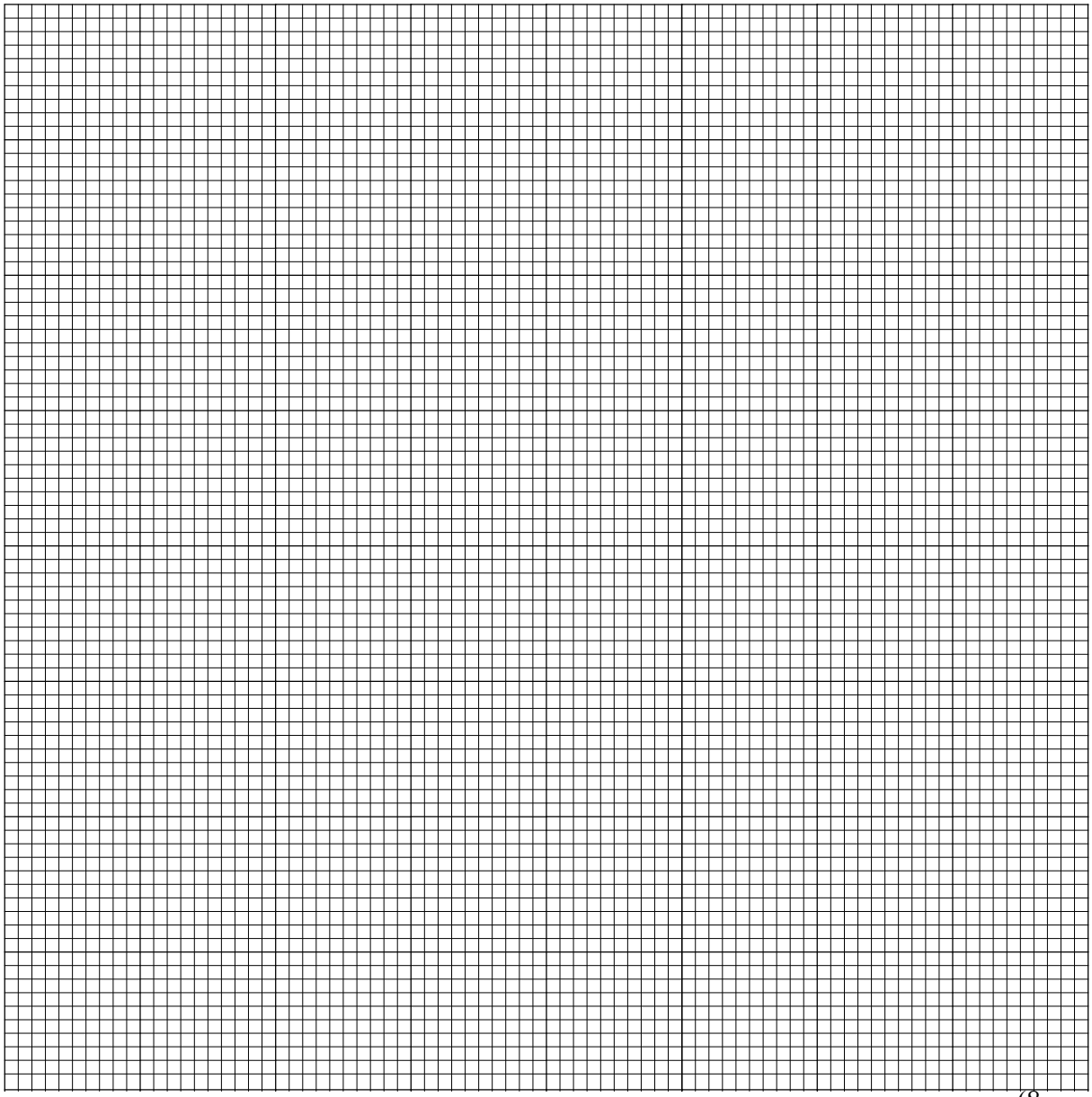
(c) Use your answers to (a) and (b) to complete the table below to give the coordinates of three points on the line with equation $y = 2x - 1$.

x	-2	0	2
y	-5		

(d) Using a scale of 2 cm for 1 unit on each axis plot the three points and draw a straight line through them.

(e) Use your graph to find the value of:

(i) y when $x = 1$ (ii) x when $y = 2$.



(8 marks)