

Write your name here

Surname

Other names

In the style of:

Pearson Edexcel

Level 1/Level 2 GCSE (9 - 1)

Centre Number

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Candidate Number

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Mathematics

Quadratics

Higher Tier

GCSE style questions arranged by topic

Paper Reference

1MA1/2H

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**



Information

- The total mark for this paper is
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►



1 Simplify fully

$$\frac{6x^2 + x - 1}{4x^2 - 1}$$

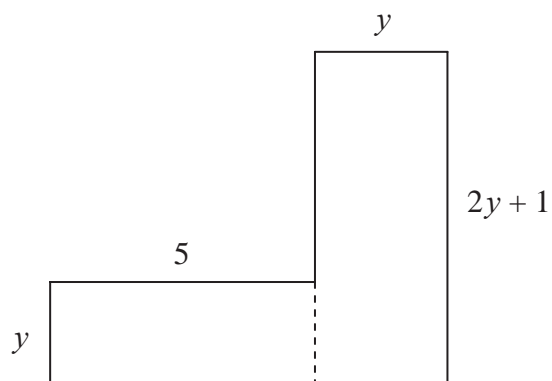
.....
(Total for Question 1 is 4 marks)

2 Simplify fully $\frac{x^2 - 8x + 15}{2x^2 - 7x - 15}$

.....
(Total for Question 2 is 3 marks)

- 3 The diagram below shows a 6-sided shape.
All the corners are right angles.
All the measurements are given in centimetres.

Diagram **NOT**
accurately drawn



The area of the shape is 95 cm^2 .

- (a) Show that $2y^2 + 6y - 95 = 0$

(3)

- (b) Solve the equation

$$2y^2 + 6y - 95 = 0$$

Give your solutions correct to 3 significant figures.

(3)

(Total for Question 3 is 6 marks)

$y = \dots\dots\dots$ or $y = \dots\dots\dots$

4 (a) Rearrange this equation

$$\frac{5}{x+2} = \frac{4-3x}{x-1}$$

to give $3x^2 + 7x - 13 = 0$

(3)

(b) Solve $3x^2 + 7x - 13 = 0$
correct to 2 decimal places.

$x = \dots\dots\dots$ or $x = \dots\dots\dots$
(3)

(Total for Question 4 is 6 marks)

5 (a) Expand and simplify $(x + 3)(x - 2)$

.....

(2)

(b) Factorise $x^2 + 7x + 10$

.....

(2)

(c) $x = 3y + 4(z - y)$

Find the value of x when $y = 6$ and $z = 5$

$x =$

(3)

(Total for Question 5 is 7 marks)

6 (a) Factorise $x^2 - 7x + 10$

.....
(2)

(b) Solve $x^2 - 7x + 10 = 0$

$x =$

or $x =$

(1)

(Total for Question 6 is 3 marks)

7 (a) Simplify $4a + 3c - 2a + c$

.....
(1)

(b) $S = \frac{1}{2}at^2$

Find the value of S when $t = 3$ and $a = \frac{1}{4}$

$S =$
(2)

(c) Factorise $x^2 - 5x$

.....
(2)

(d) Expand and simplify $(x + 3)(x + 4)$

.....
(2)

(e) Factorise $y^2 + 8y + 15$

.....
(2)

(Total for Question 7 is 9 marks)

8 (a) Simplify $(c^2 k^5)^4$

.....
(1)

(b) Expand and simplify $(3x + 5)(4x - 1)$

.....
(2)

(c) Solve $x^2 - 3x - 10 = 0$

$x =$
(3)

(Total for Question 8 is 6 marks)

9 The plan below shows a large rectangle of length $(2x + 6)$ m and width x m.

A smaller rectangle of length x m and width 3 m is cut out and removed.

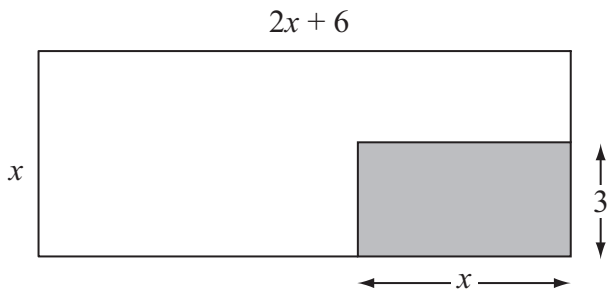


Diagram **NOT** accurately drawn

The area of the shape that is left is 100 m^2 .

(a) Show that $2x^2 + 3x - 100 = 0$

(3)

(b) Calculate the length of the smaller rectangle.
Give your answer correct to 3 significant figures.

..... m

(4)

(Total for Question 9 is 7 marks)

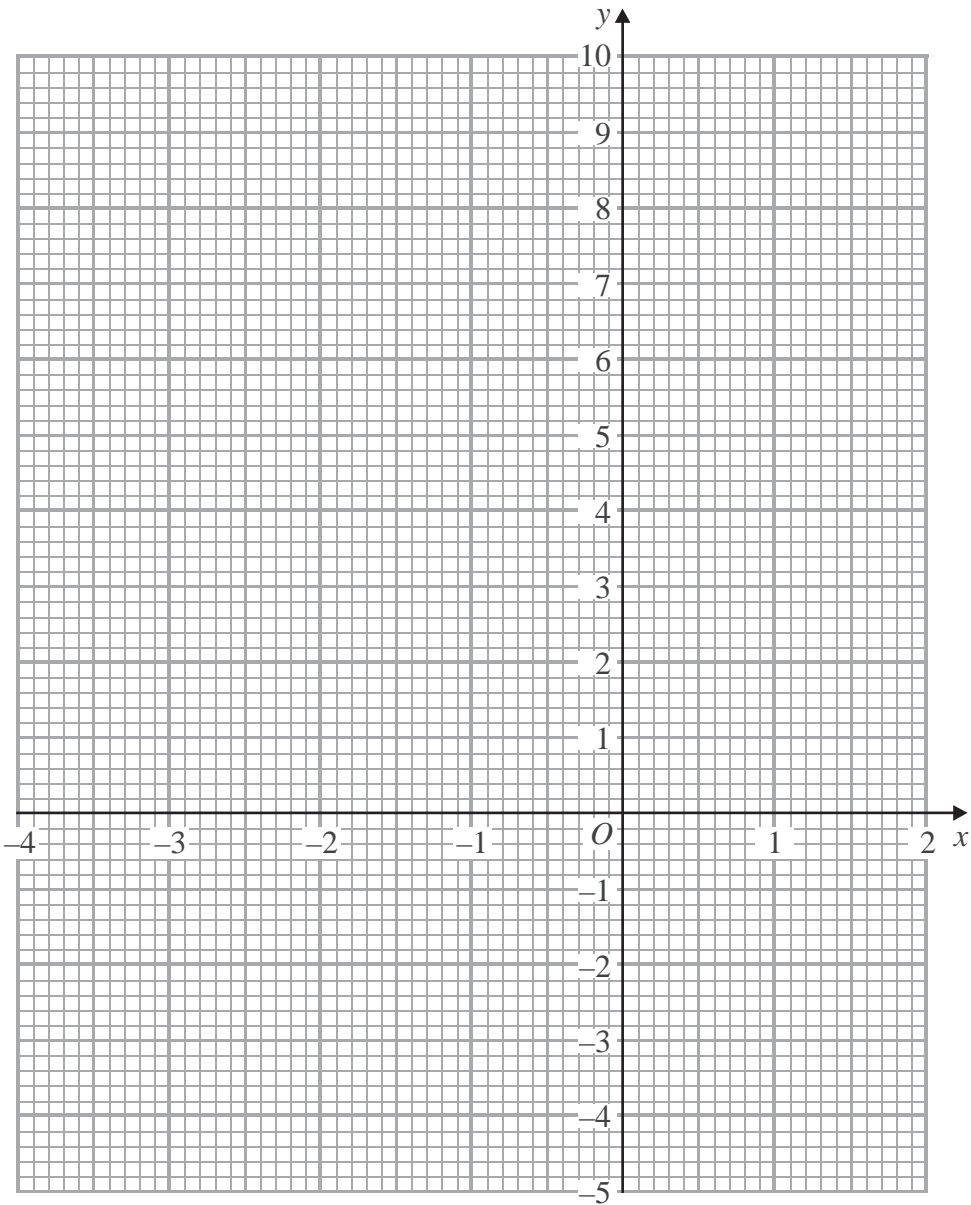
10 (a) Complete the table of values for $y = x^2 + x - 2$

x	-4	-3	-2	-1	0	1	2
y	10		0	-2			4

(2)

(b) On the grid below, draw the graph of $y = x^2 + x - 2$ for values of x from -4 to 2

(2)



(c) Use your graph to find estimates for the solutions of $x^2 + x - 2 = 0$

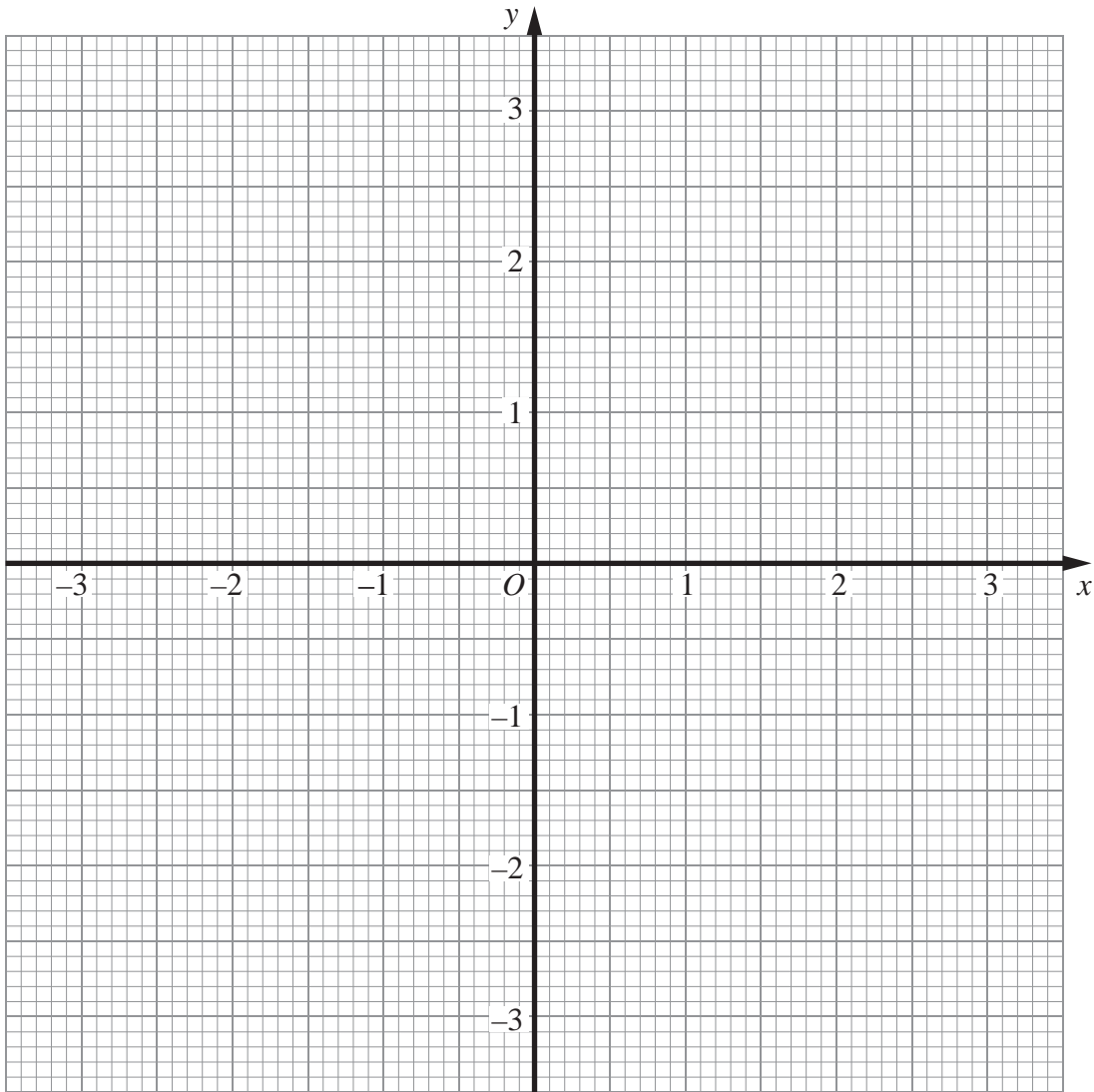
$x =$

$x =$

(1)

(Total for Question 10 is 5 marks)

11 (a) Construct the graph of $x^2 + y^2 = 9$



(2)

(b) By drawing the line $x + y = 2$ on the grid, solve the equations $x^2 + y^2 = 9$
 $x + y = 2$

$x = \dots\dots\dots$, $y = \dots\dots\dots$

or $x = \dots\dots\dots$, $y = \dots\dots\dots$

(3)

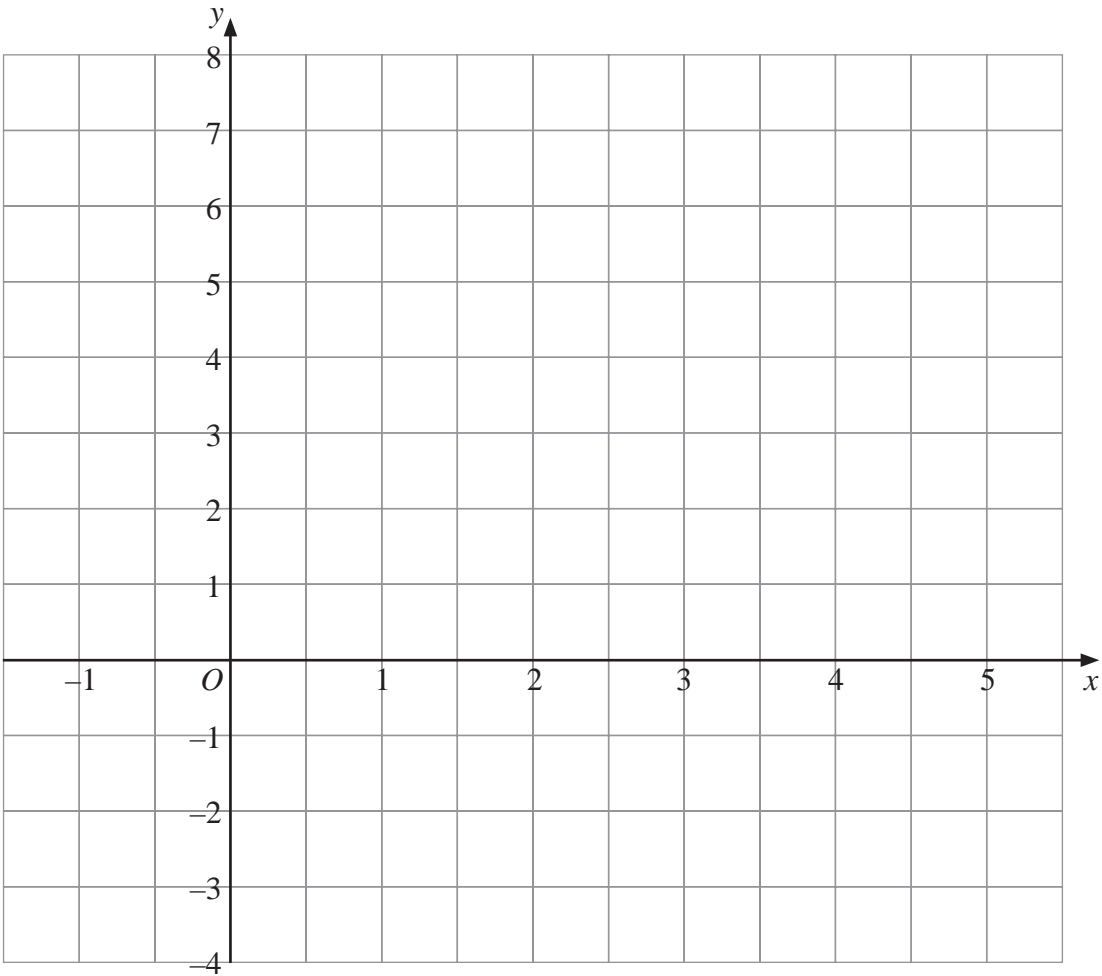
(Total for Question 11 is 5 marks)

12 (a) Complete the table of values for $y = x^2 - 4x + 1$

x	-1	0	1				
y		1	-2		-2		6

(2)

(b) On the grid, draw the graph of $y = x^2 - 4x + 1$



(2)

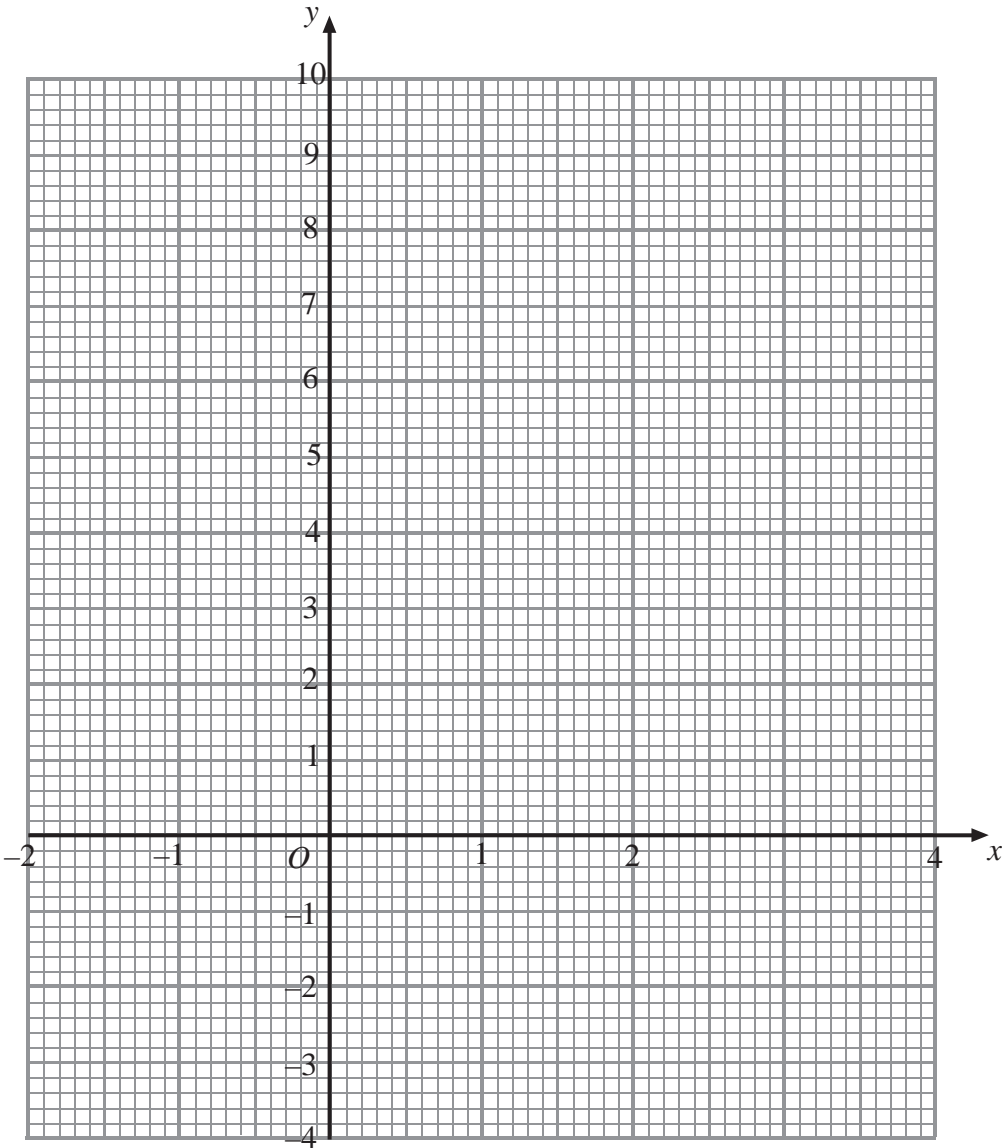
(Total for Question 12 is 4 marks)

13 (a) Complete the table of values for $y = x^2 - 3x - 1$

x	-2	-1	0				
y		3	1	-3		-1	

(2)

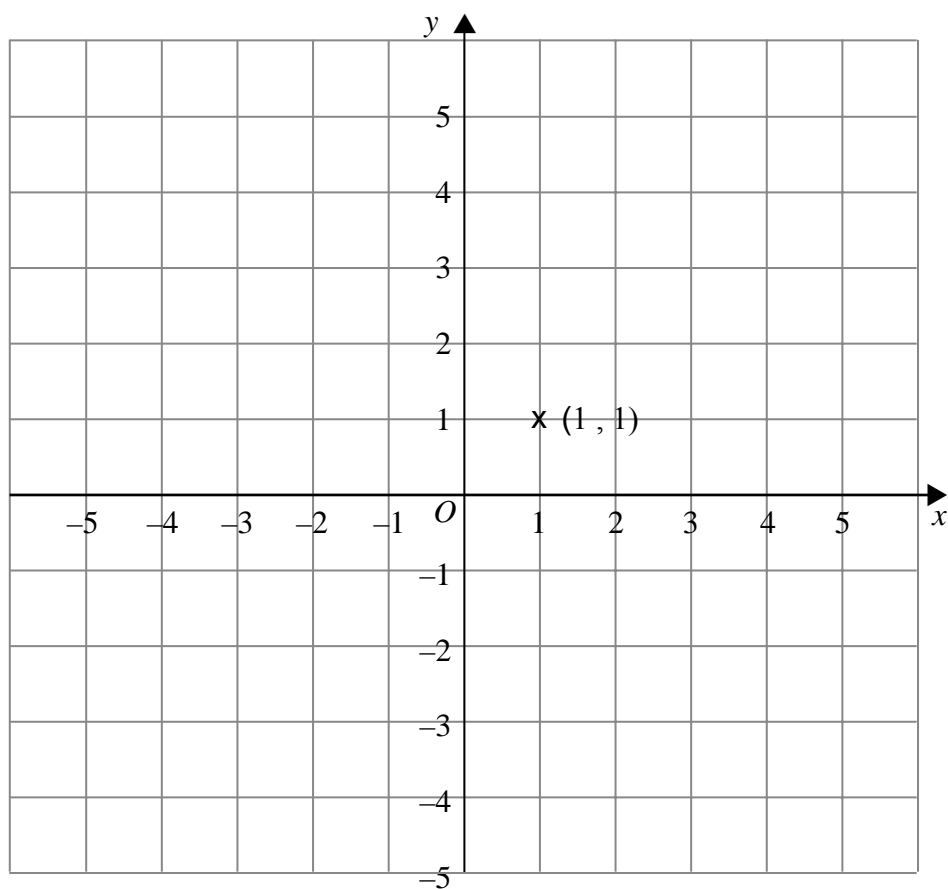
(b) On the grid, draw the graph of $y = x^2 - 3x - 1$ for values of x from - 2 to 4



(2)

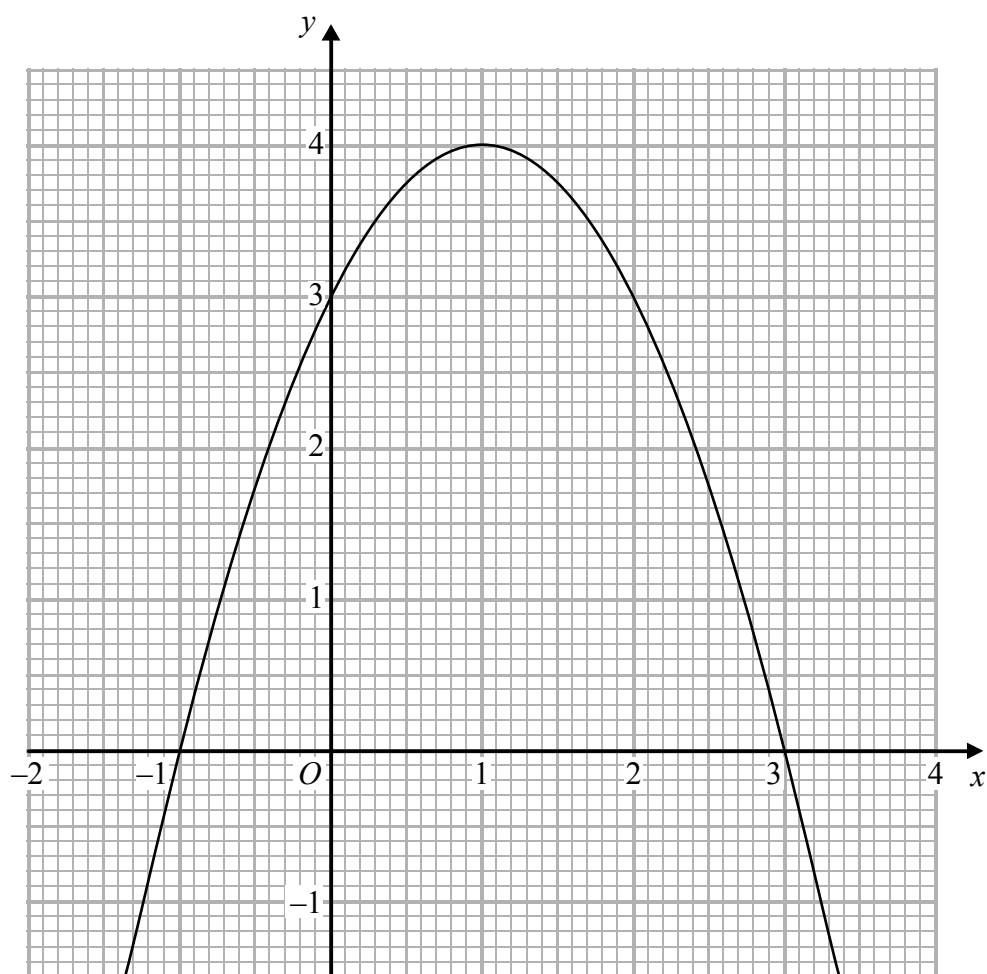
(Total for Question 13 is 4 marks)

- 14** Show that any straight line that passes through the point $(1, 1)$ must intersect the curve with equation $x^2 + y^2 = 16$ at two points.



(Total for Question 14 is 3 marks)

15 The graph of $y = f(x)$ is drawn on the grid.



(a) Write down the coordinates of the turning point of the graph.

(1)

(b) Write down the roots of $f(x) = 2$

(1)

(c) Write down the value of $f(0.5)$

(1)

(Total for Question 15 is 3 marks)

16 $2x^2 - 6x + 5$ can be written in the form $a(x - b)^2 + c$
where a , b and c are positive numbers.

(a) Work out the values of a , b and c .

$a =$

$b =$

$c =$

(2)

(b) Using your answer to part (a), or otherwise, solve $2x^2 - 6x + 5 = 8.5$

.....
(3)

(Total for Question 16 is 5 marks)

17 (a) Write $x^2 + 10x + 29$ in the form $(x + a)^2 + b$

.....

(3)

(b) Write down the coordinates of the turning point of the graph of $y = x^2 + 10x + 29$.

(..... ,)

(1)

(Total for Question 17 is 4 marks)

18 Solve these simultaneous equations algebraically.

$$y = x - 3$$

$$y = 2x^2 + 8x - 7$$

$$x = \dots\dots\dots, y = \dots\dots\dots$$

$$x = \dots\dots\dots, y = \dots\dots\dots$$

(6)

(Total for Question 18 is 6 marks)