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 80
- 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.
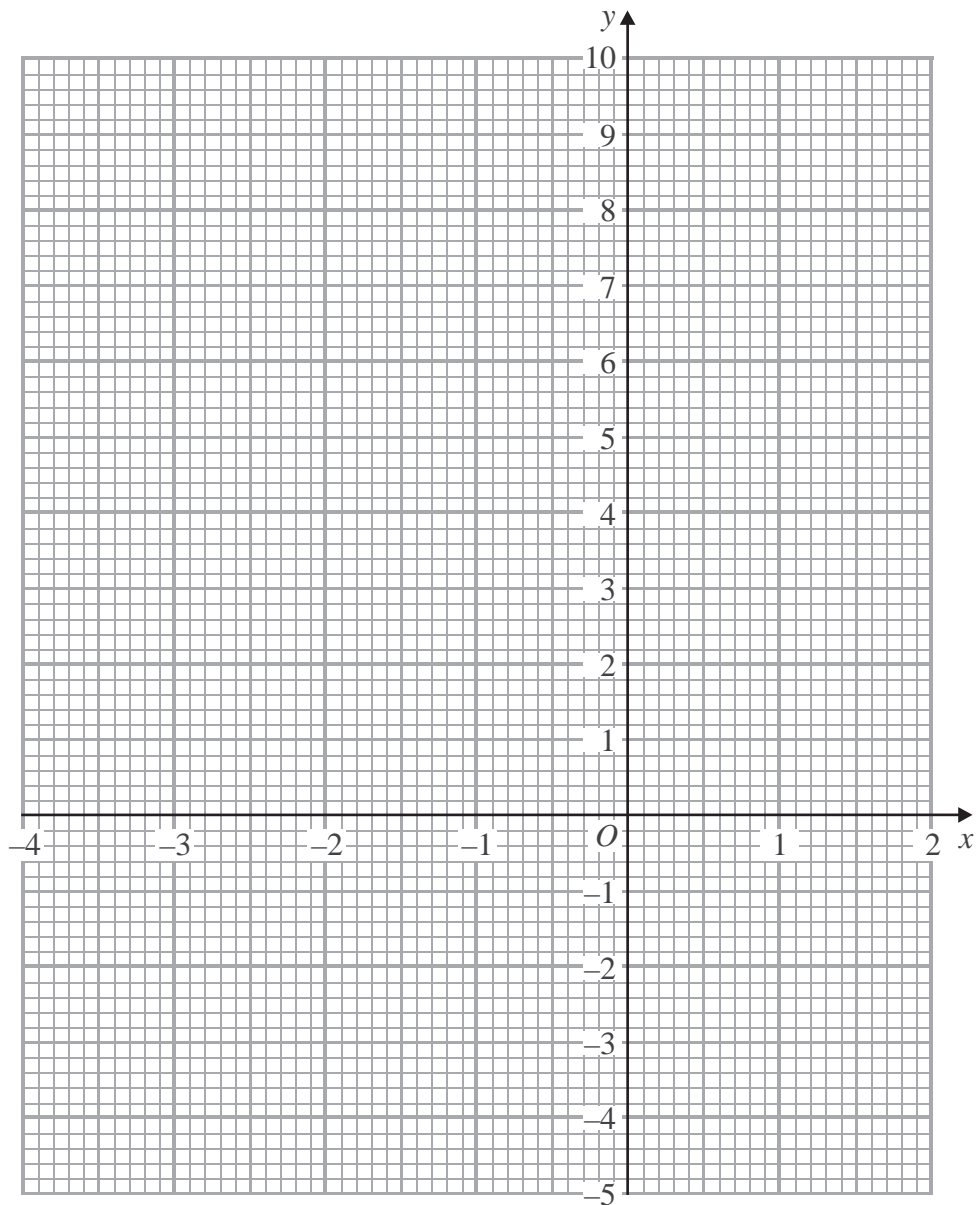- Check your answers if you have time at the end.

Turn over ▶

1 (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)

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

$x = $ ....

$x = $ ....

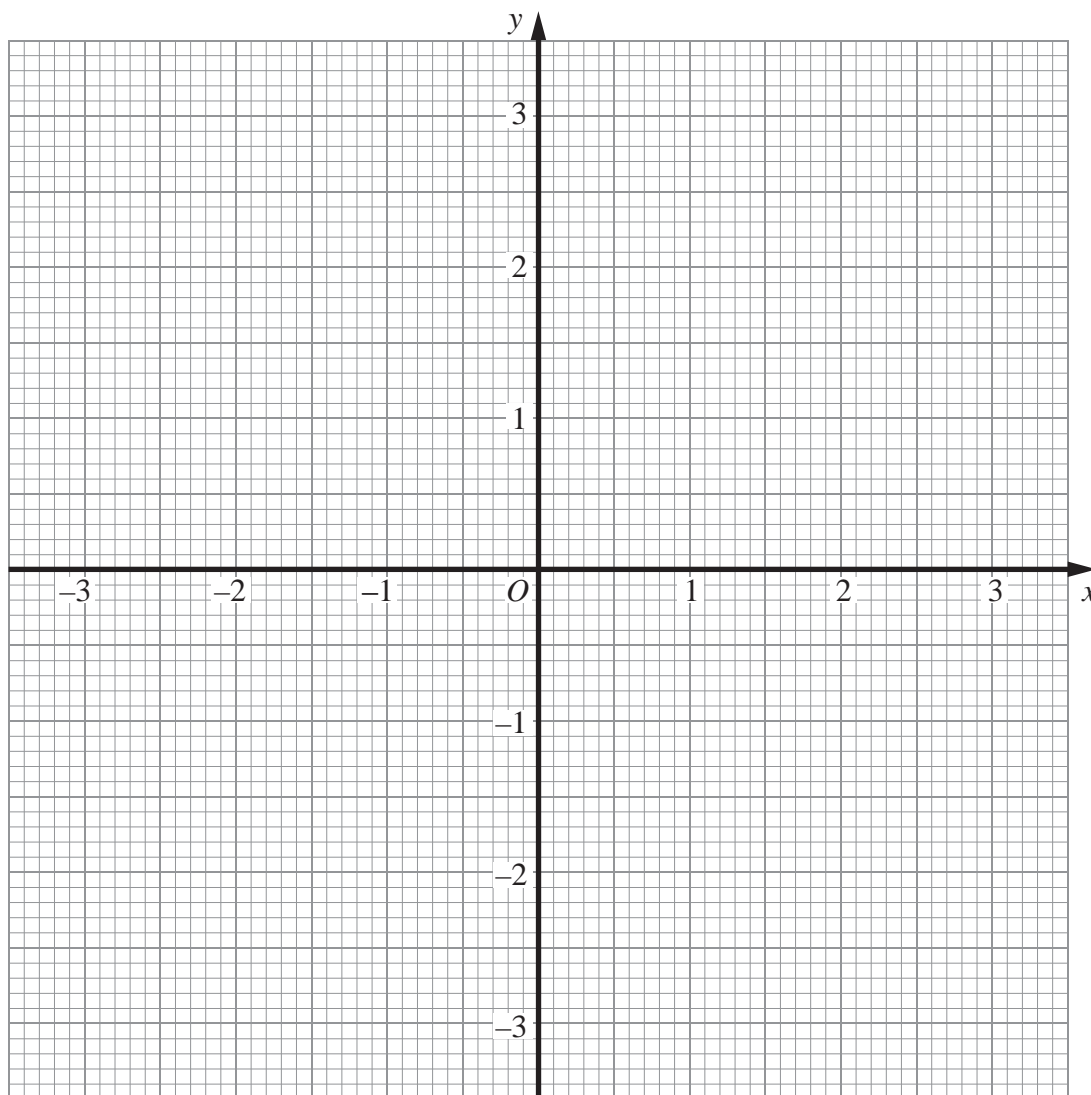**(1)**

(Total for Question 1 is 5 marks)

2 (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 $\quad x^2 + y^2 = 9$
$$x + y \ = 2$$

$x =$........................ , $y =$........................

or $\ x =$........................ , $y =$........................

(3)

(Total for Question 2 is 5 marks)

3 (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)
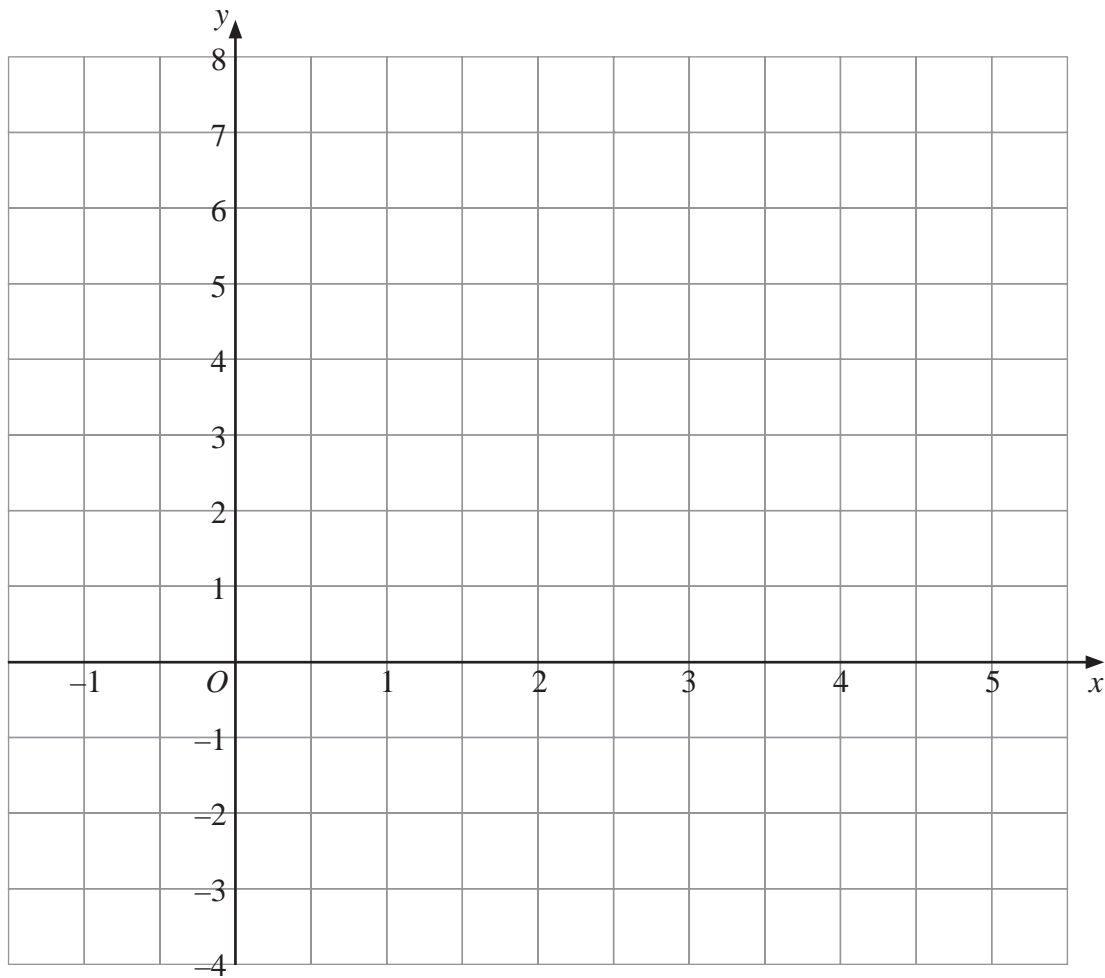
(Total for Question 3 is 4 marks)

4 (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
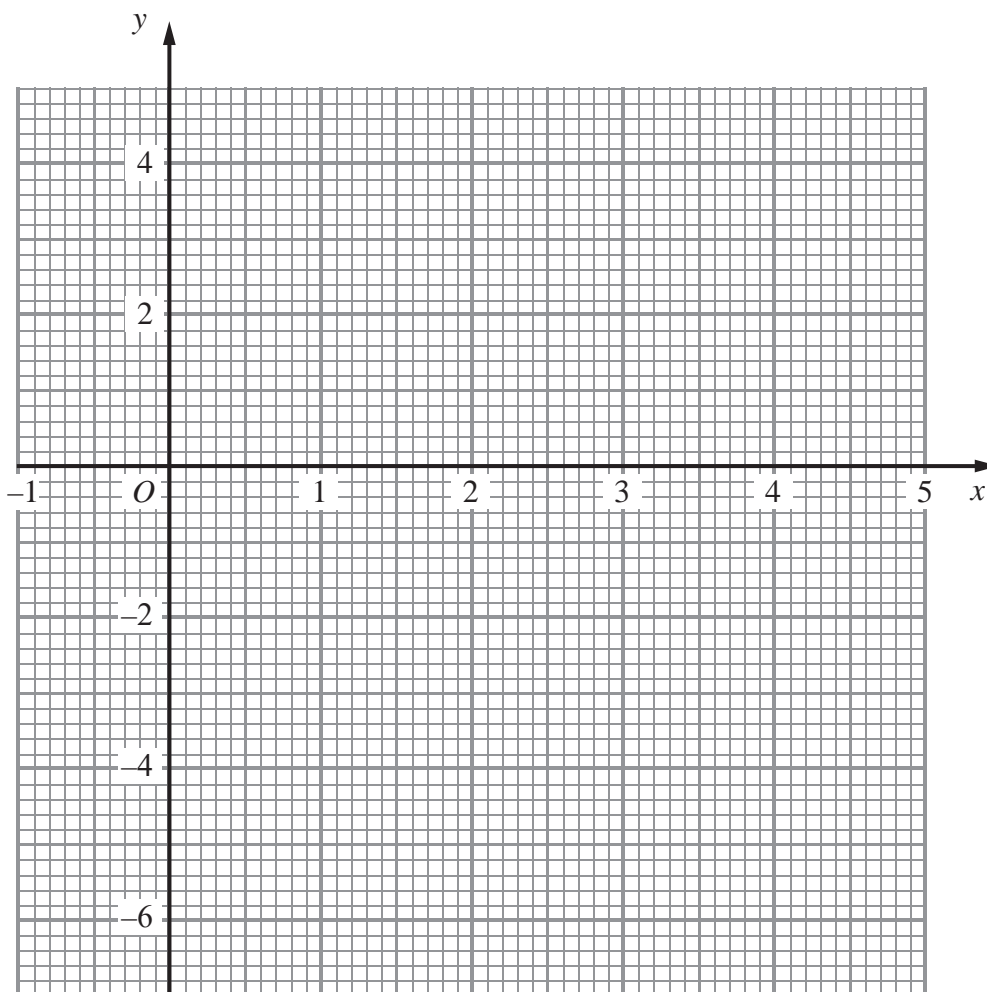

(2)
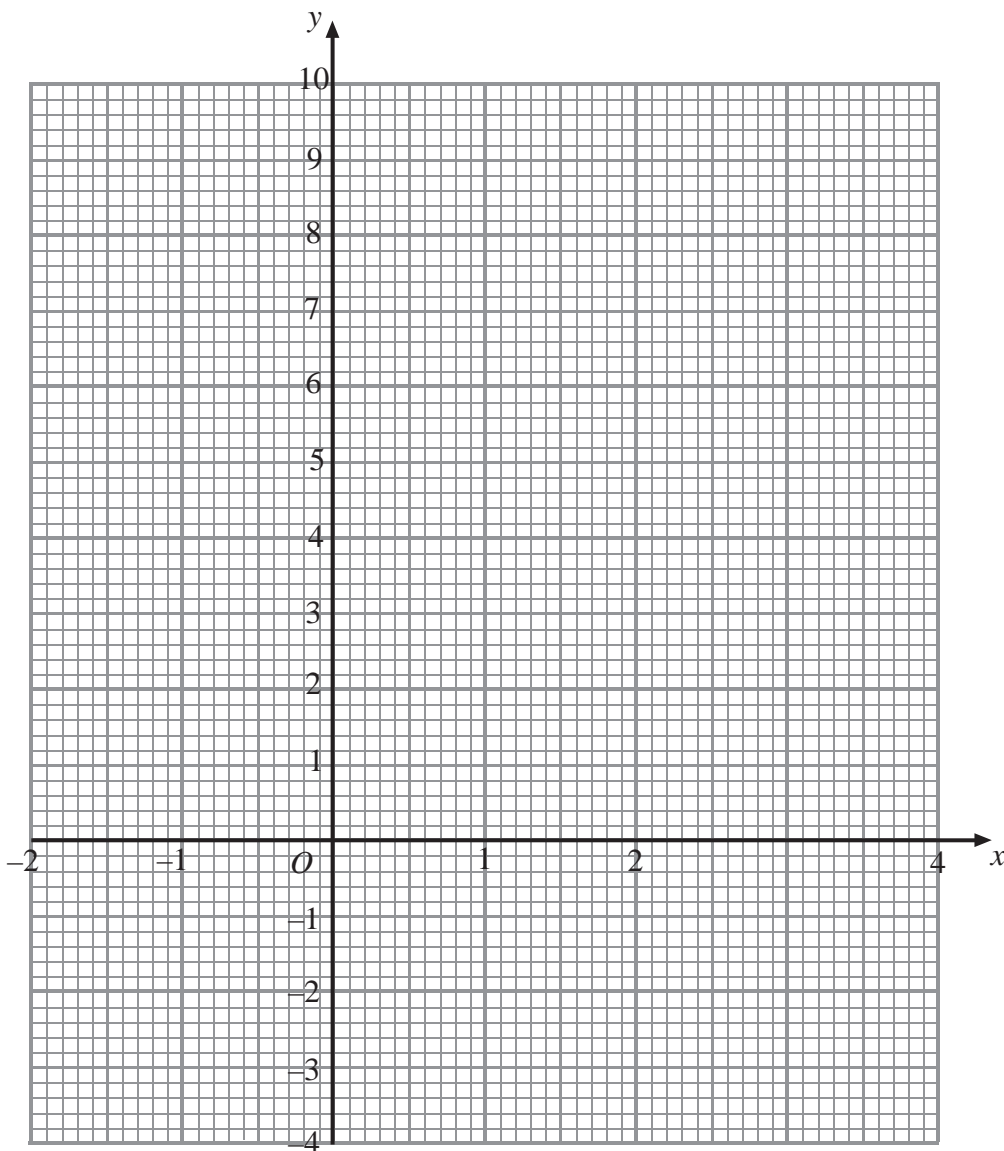
(Total for Question 4 is 4 marks)

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

x	-1	**0**	1				
y		-1	-4			-1	4

(2)

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

(2)

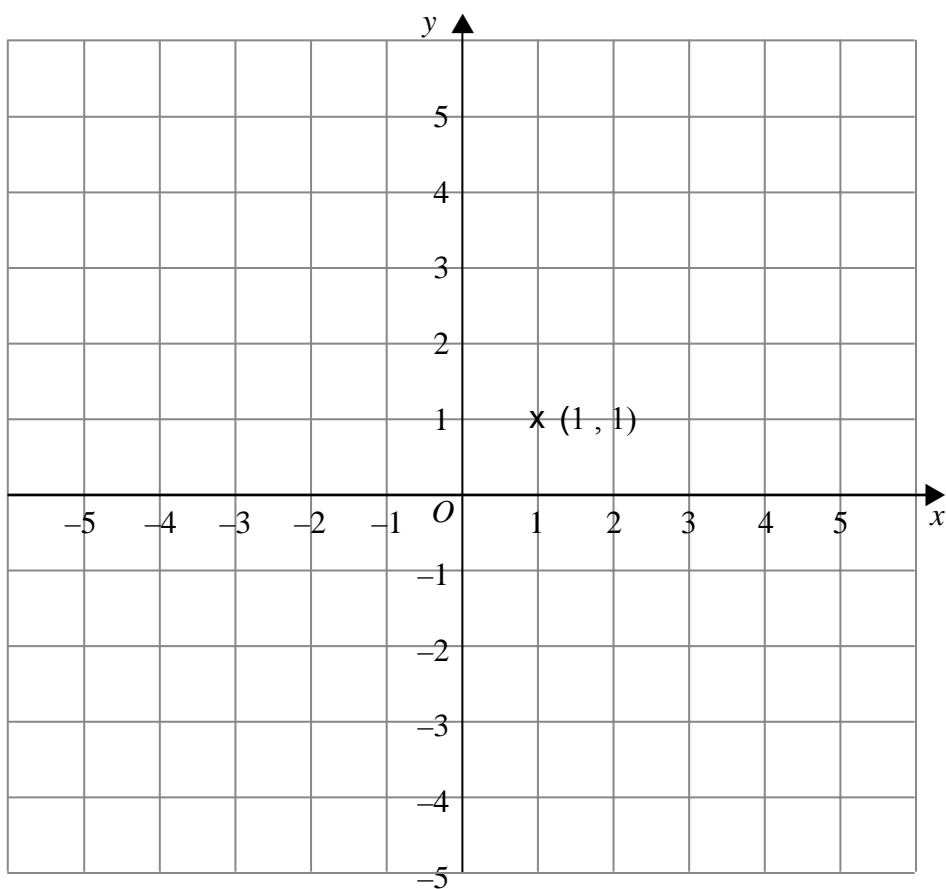(c) Use your graph to estimate the values of x when $y = -3$

$x =$ ....

$x =$ ....

(2)

(Total for Question 5 is 6 marks)

6 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 6 is 3 marks)