



- 1 Complete the table of values for $y = x^2 - 2$

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

(2 marks)

When $x = -1$: $y = (-1)^2 - 2 = 1 - 2 = -1$

When $x = 1$: $y = 1^2 - 2 = -1$

- 2 Complete the table of values for $y = x^2 + 3$

x	-3	-2	-1	0	1	2	3
y		7		3	4		12

Write down the equation of the line of symmetry of the graph.

(3 marks)

a)

$x = -3$: $(-3)^2 + 3 = 9 + 3 = 12$

$x = -1$: $(-1)^2 + 3 = 1 + 3 = 4$

$x = 2$: $2^2 + 3 = 4 + 3 = 7$

b)

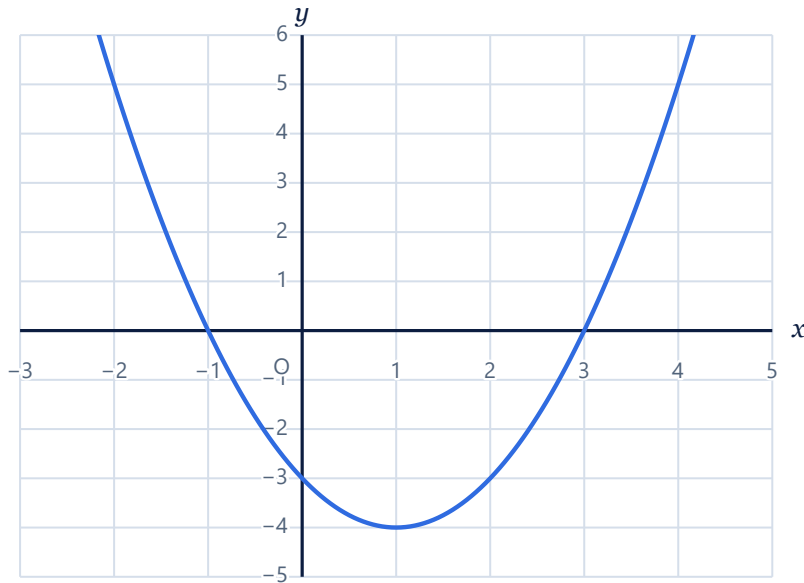
y values repeat either side of $x = 0$

$x = 0$

3

The diagram shows the graph of $y = x^2 - 2x - 3$

- Write down the coordinates of the point where the graph crosses the y -axis.
- Write down the solutions of $x^2 - 2x - 3 = 0$
- Write down the coordinates of the turning point of the graph.



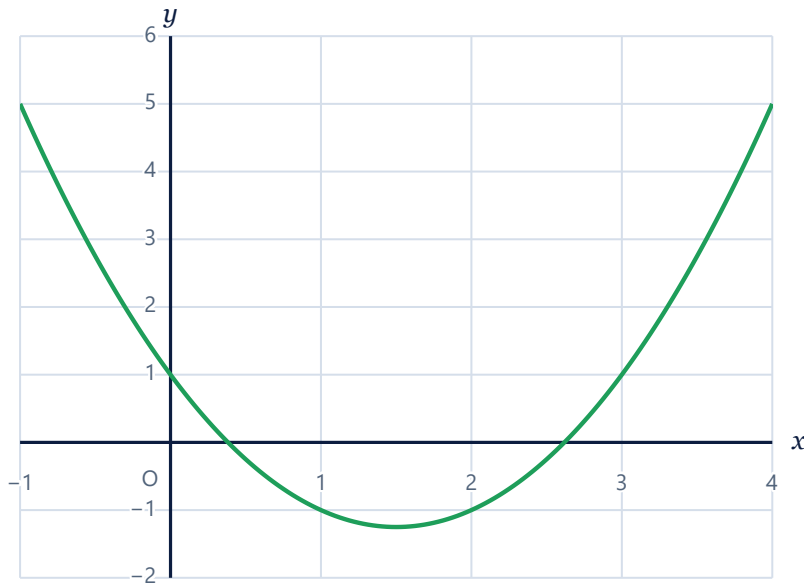
(3 marks)

- The graph crosses the y -axis where $x = 0$: $y = -3$, so $(0, -3)$
- The graph crosses the x -axis at $x = -1$ and $x = 3$
- The lowest point of the curve is at $(1, -4)$

4

a. Complete the table of values for $y = x^2 - 3x + 1$

x	-1	0	1	2	3	4
y	5	1		-1		

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

(4 marks)

a) When $x = 1$: $y = 1 - 3 + 1 = -1$

a) When $x = 3$: $y = 9 - 9 + 1 = 1$

a) When $x = 4$: $y = 16 - 12 + 1 = 5$

b) Plot all six points and join them with a smooth curve

5

Complete the table of values for $y = x^2 - x - 2$

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

- Complete the table.
- Use your table to write down the two solutions of $x^2 - x - 2 = 0$.
- Work out the value of y when $x = 1.5$.

(4 marks)

a)

$$x = -1: 1 + 1 - 2 = 0$$

$$x = 1: 1 - 1 - 2 = -2$$

b)

$$y = 0 \text{ when } x = -1 \text{ and } x = 2$$

$$x = -1, x = 2$$

c)

$$1.5^2 - 1.5 - 2$$

$$= 2.25 - 1.5 - 2$$

$$-1.25$$

6

a. Complete the table of values for $y = 6 - x^2$

x	-3	-2	-1	0	1	2	3
y	-3		5		5		-3

- Write down the coordinates of the maximum point of the graph of $y = 6 - x^2$
- Use the table to write down the two consecutive whole numbers that the positive solution of $6 - x^2 = 0$ lies between.

(4 marks)

$$\text{a) When } x = -2: y = 6 - 4 = 2; \text{ when } x = 0: y = 6; \text{ when } x = 2: y = 6 - 4 = 2$$

$$\text{b) The largest value of } y \text{ is } 6, \text{ at } x = 0, \text{ so the maximum point is } (0, 6)$$

$$\text{c) Between } x = 2 \text{ and } x = 3 \text{ the } y\text{-values change from } 2 \text{ to } -3, \text{ so } y = 0 \text{ somewhere between them}$$

7

a. Complete the table of values for $y = x^2 + 2x - 8$

x	-4	-3	-2	-1	0	1	2
y	0	-5		-9		-5	

b. Use the table to write down the solutions of $x^2 + 2x - 8 = 0$ c. Write down the equation of the line of symmetry of the graph of $y = x^2 + 2x - 8$

(4 marks)

a) When $x = -2$: $y = 4 - 4 - 8 = -8$; when $x = 0$: $y = -8$; when $x = 2$: $y = 4 + 4 - 8 = 0$

b) $y = 0$ in the table at $x = -4$ and $x = 2$, so these are the solutions

c) The line of symmetry is halfway between the roots

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

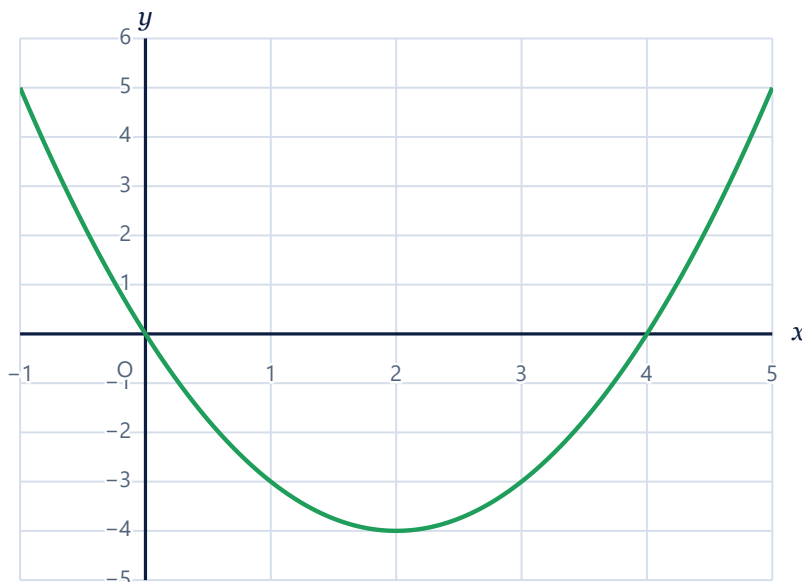
8

a. Complete the table of values for $y = x^2 - 4x$

x	-1	0	1	2	3	4	5
y	5	0			-3		5

b. On the grid, draw the graph of $y = x^2 - 4x$ for values of x from -1 to 5

c. Write down the coordinates of the turning point of the graph.



(5 marks)

a) When $x = 1$: $y = 1 - 4 = -3$; when $x = 2$: $y = 4 - 8 = -4$; when $x = 4$: $y = 16 - 16 = 0$

b) Plot the seven points and join with a smooth curve

c) The minimum point of the curve is (2, -4)

- 9 Here is a table of values for $y = x^2 - 6x + 5$

x	0	1	2	3	4	5	6
y	5	0		-4		0	5

- a. Complete the table.
b. Write down the equation of the line of symmetry and the coordinates of the turning point of the graph.
c. Work out the value of y when $x = 3.5$.

(4 marks)

a.)

$$x = 2: 4 - 12 + 5 = -3$$

$$x = 4: 16 - 24 + 5 = -3$$

b.)

y values mirror about $x = 3$; lowest $y = -4$

$$x = 3, (3, -4)$$

c.)

$$12.25 - 21 + 5$$

$$-3.75$$

- 10 Here is a table of values for $y = 2x^2 + x - 6$

x	-3	-2	-1	0	1	2
y		0		-6		4

- a. Complete the table.
b. Use the table to write down one solution of $2x^2 + x - 6 = 0$.
c. Show that $x = 1.5$ is also a solution of $2x^2 + x - 6 = 0$.

(4 marks)

a.)

$$x = -3: 2 \times 9 - 3 - 6 = 9$$

$$x = -1: 2 \times 1 - 1 - 6 = -5$$

$$x = 1: 2 \times 1 + 1 - 6 = -3$$

b.)

$$x = -2$$

c.)

$$2 \times 1.5^2 + 1.5 - 6$$

$$= 4.5 + 1.5 - 6$$

$$= 0$$

11

a. Complete the table of values for $y = 2x^2 - 3$

x	-2	-1	0	1	2
y	5			-1	

b. Write down the coordinates of the turning point of the graph of $y = 2x^2 - 3$ c. Use the table to write down the two consecutive whole numbers that the positive solution of $2x^2 - 3 = 0$ lies between.

(5 marks)

a) When $x = -1$: $y = 2 - 3 = -1$; when $x = 0$: $y = -3$; when $x = 2$: $y = 8 - 3 = 5$

b) The minimum value of y is -3 , at $x = 0$, so the turning point is $(0, -3)$

c) Between $x = 1$ and $x = 2$ the y -values change from -1 to 5 , so $y = 0$ somewhere between them

12

Here is a table of values for $y = x^2 - 4x + 3$

x	-1	0	1	2	3	4	5
y	8	3		-1		3	8

a. Complete the table.

b. Write down the coordinates of the turning point.

c. Use the table to solve $x^2 - 4x + 3 = 0$.d. Work out the value of y when $x = 6$.

(4 marks)

a)

$$x = 1: 1 - 4 + 3 = 0$$

$$x = 3: 9 - 12 + 3 = 0$$

b)

$(2, -1)$

c)

$$y = 0 \text{ at } x = 1 \text{ and } x = 3$$

$x = 1, x = 3$

d)

$$6^2 - 4 \times 6 + 3$$

$$= 36 - 24 + 3$$

15

13

A ball is thrown upwards. Its height, h metres, after t seconds is given by $h = 12t - 3t^2$

t	0	1	2	3	4
h	0	9		9	

- Complete the table.
- Write down the greatest height of the ball and when it reaches it.
- Work out the height of the ball after 1.5 seconds.
- After how many seconds does the ball hit the ground?

(4 marks)

a)

$$t = 2: 24 - 12 = 12$$

$$t = 4: 48 - 48 = 0$$

b)

12 m, after 2 s

c)

$$12 \times 1.5 - 3 \times 1.5^2$$

$$= 18 - 6.75$$

11.25 m

d)

$$h = 0 \text{ at } t = 4$$

4 seconds