



ACHIEVE ACADEMY

GCSE Maths — Foundation Tier

Quadratic, Cubic & Reciprocal Graphs · Practice Booklet

NAME: _____

CLASS: _____

DATE: _____

☐ Developing

☒ Secure

☐ Greater Depth

Answer every question in the working space provided. Method marks are available for correct working even if the final answer is wrong. Check the time allowed with your tutor before you start.

Quadratic, Cubic & Reciprocal Graphs

Total marks available: 105

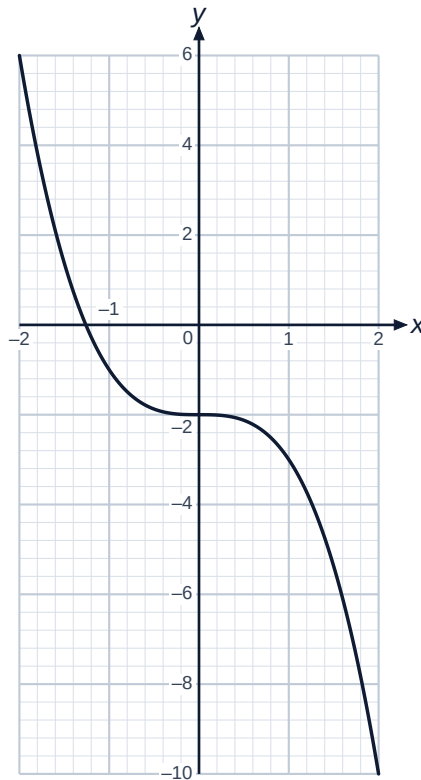
● Quadratic, Cubic & Reciprocal Graphs

Q1

[2 marks]

The graph of $y = -x^3 - 2$ is drawn on the grid.

- (a) Write down the coordinates of the point where the graph crosses the y-axis.
(b) Use the graph to find the value of y when $x = -2$.



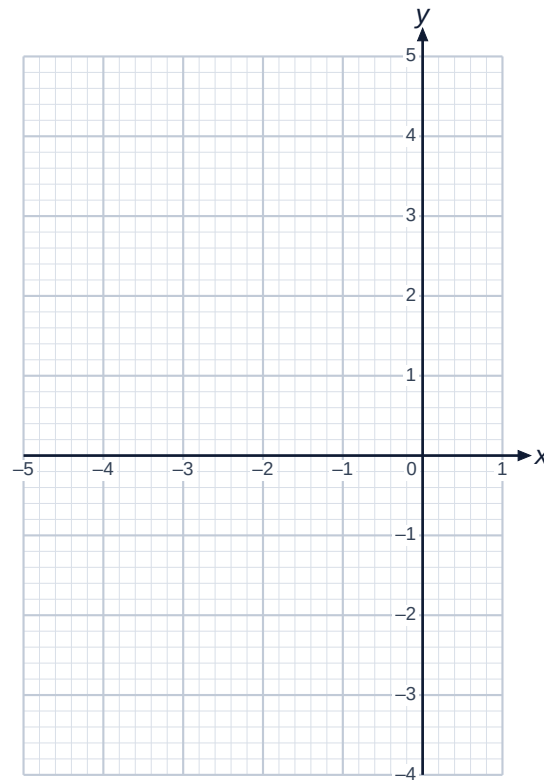
Q2

[2 marks]

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

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

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



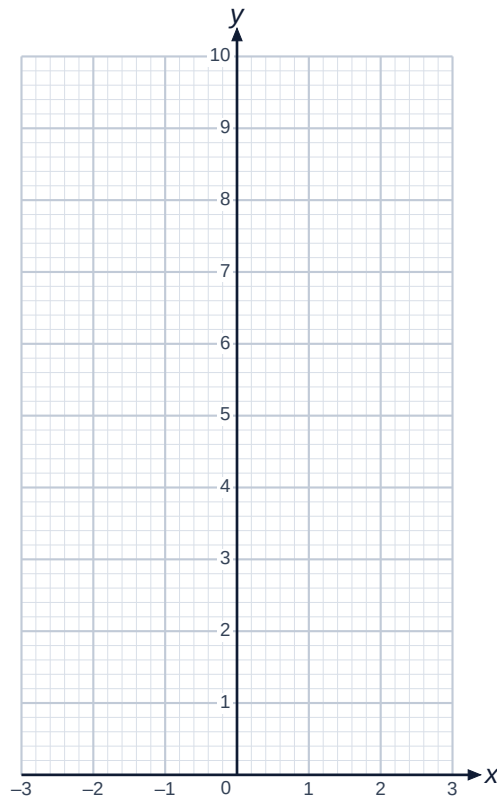
Q3

[2 marks]

Here is a table of values for $y = x^2 + 1$.

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

x	-3	-2	-1	0	1	2	3
y	10	5	2	1	2	5	10



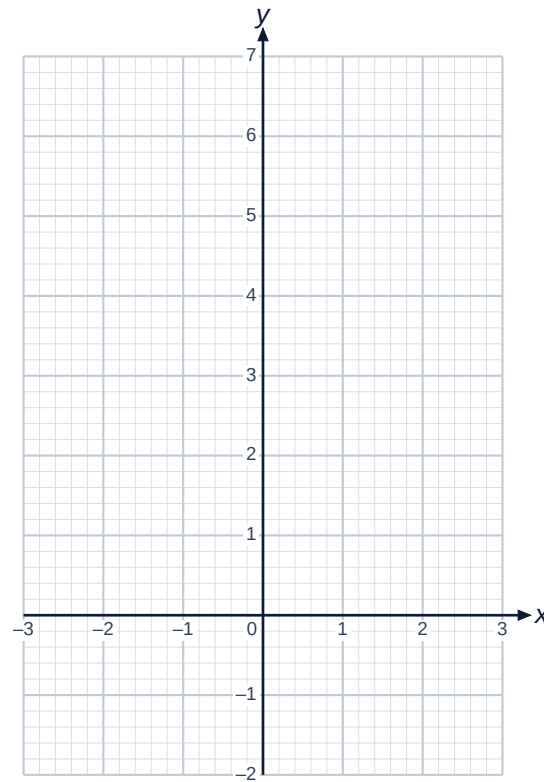
Q4

[2 marks]

Here is a table of values for $y = x^2 - 2$.

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

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



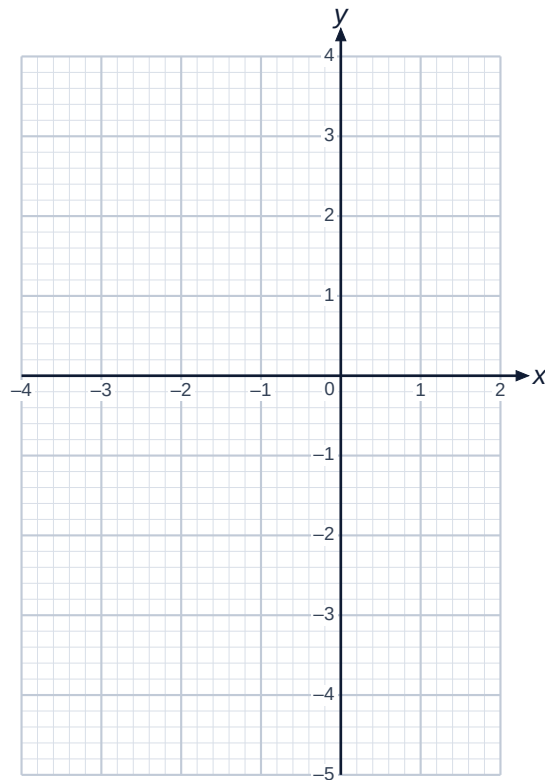
Q5

[4 marks]

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

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

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



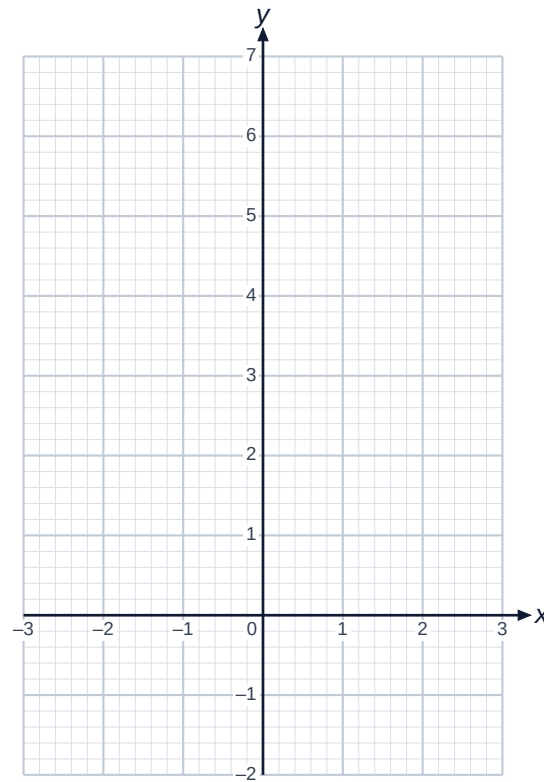
Q6

[4 marks]

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

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

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

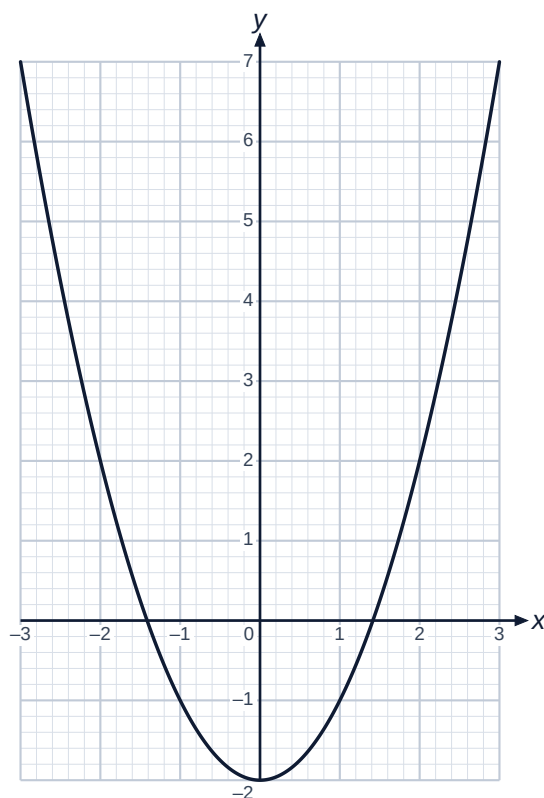


Q7

[2 marks]

The graph of $y = x^2 - 2$ is drawn on the grid.

- (a) Write down the coordinates of the point where the graph crosses the y -axis.
(b) Use the graph to find the value of y when $x = 2$.

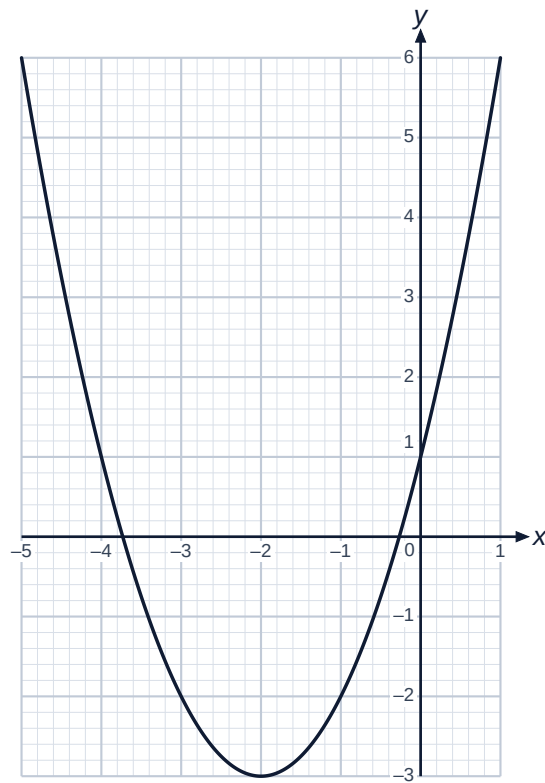


Q8

[2 marks]

The graph of $y = x^2 + 4x + 1$ is drawn on the grid.

- (a) Write down the coordinates of the point where the graph crosses the y -axis.
(b) Use the graph to find the value of y when $x = -2$.



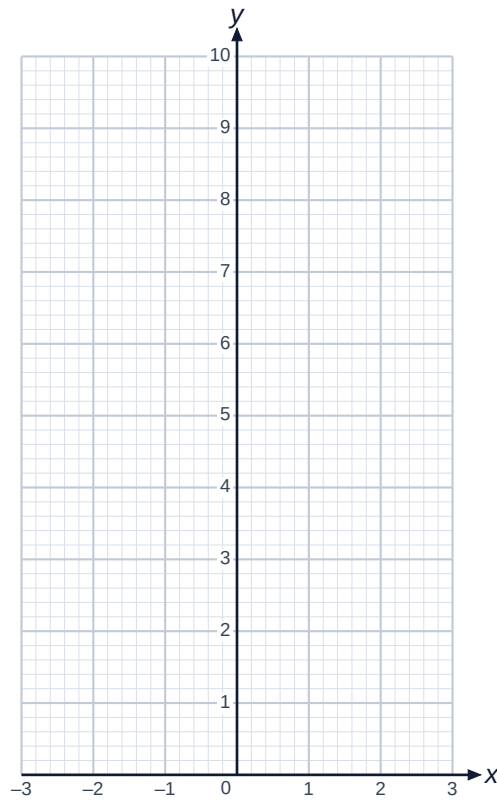
Q9

[4 marks]

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

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

x	-3	-2	-1	0	1	2	3
y		5	2		2		10



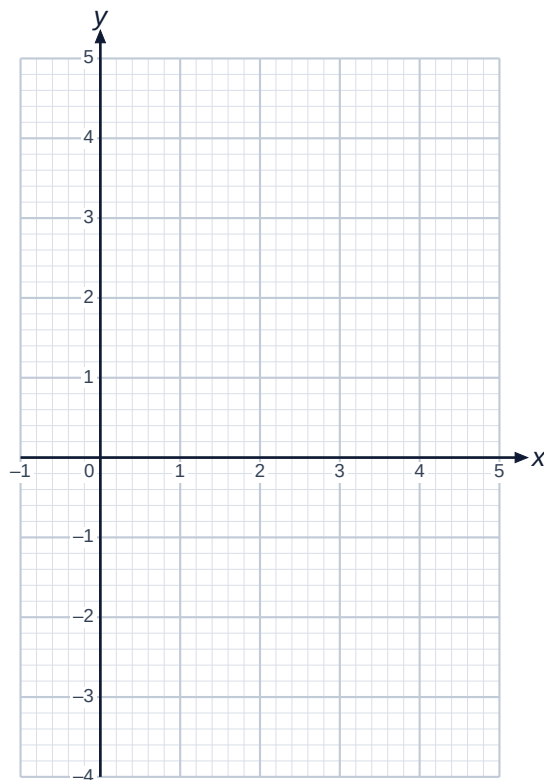
Q10

[2 marks]

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

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

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



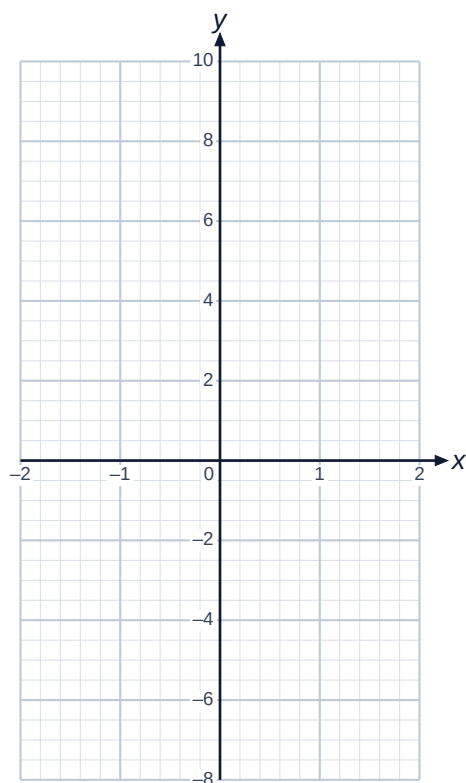
Q11

[4 marks]

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

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

x	-2	-1	0	1	2
y	9	2	1		

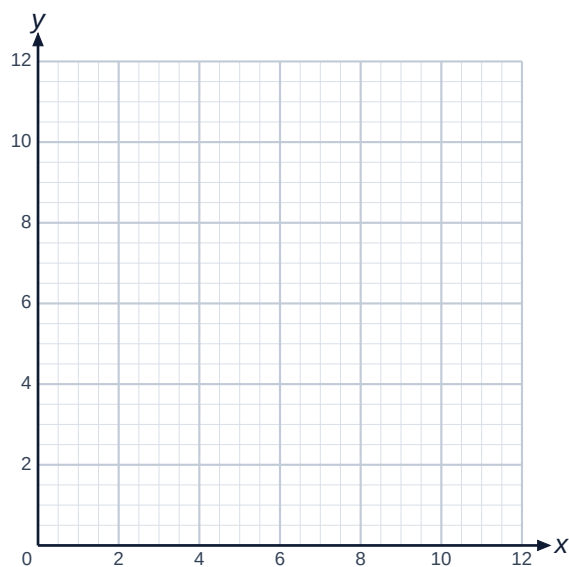


Q12

[4 marks]

- (a) Complete the table of values for $y = \frac{12}{x}$.
- (b) On the grid, draw the graph of $y = \frac{12}{x}$ for values of x from 1 to 12.

x	1	2	3	4	6	8	12
y			4	3	2	1.5	1

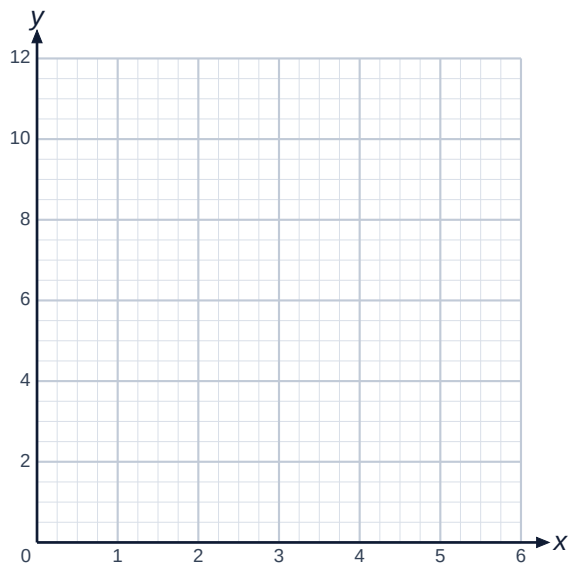


Q13

[4 marks]

- (a) Complete the table of values for $y = \frac{6}{x}$.
- (b) On the grid, draw the graph of $y = \frac{6}{x}$ for values of x from 0.5 to 6.

x	0.5	1	2	3	4	6
y	12	6		2		1



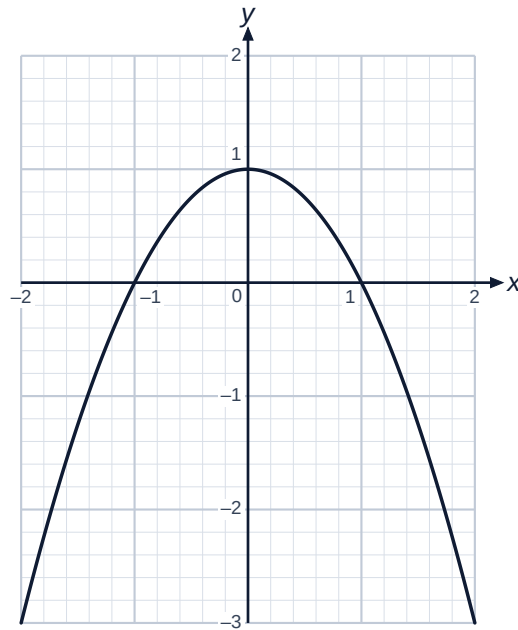
Q14

[3 marks]

The graph of $y = -x^2 + 1$ is drawn on the grid.

(a) Use the graph to write down the roots of $-x^2 + 1 = 0$.

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



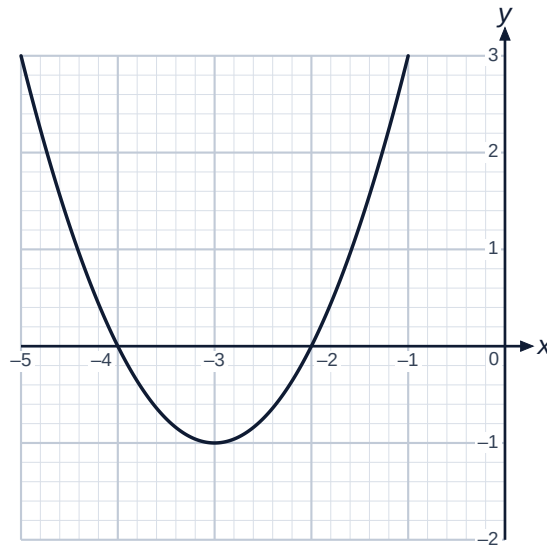
Q15

[3 marks]

The graph of $y = x^2 + 6x + 8$ is drawn on the grid.

(a) Use the graph to write down the roots of $x^2 + 6x + 8 = 0$.

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



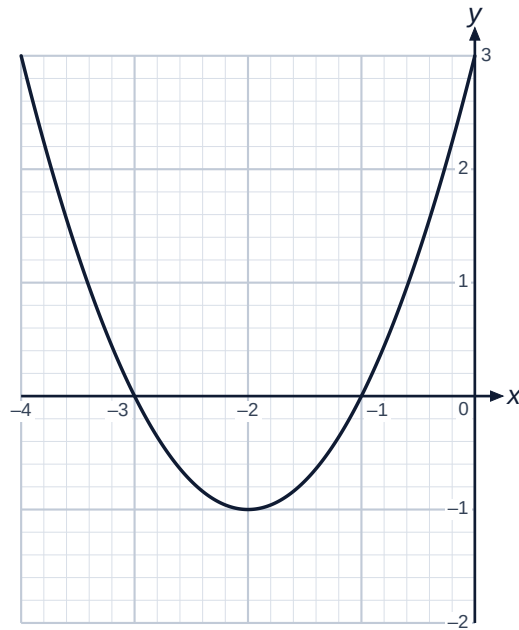
Q16

[3 marks]

The graph of $y = x^2 + 4x + 3$ is drawn on the grid.

(a) Use the graph to write down the roots of $x^2 + 4x + 3 = 0$.

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



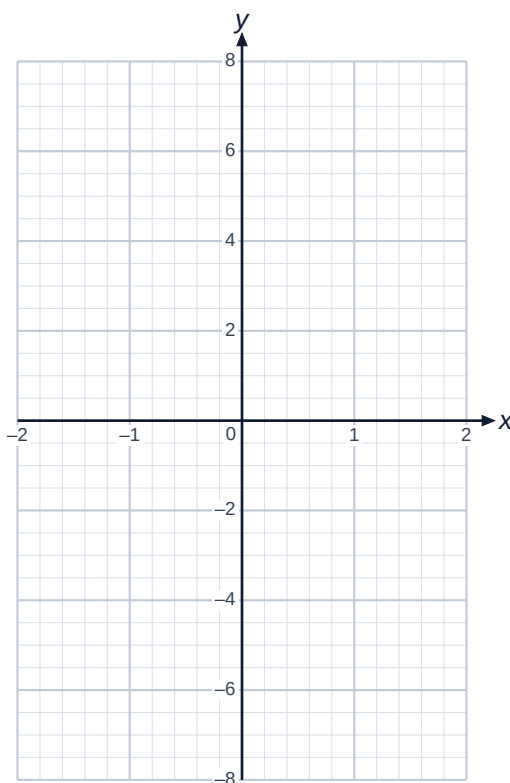
Q17

[4 marks]

(a) Complete the table of values for $y = x^3$.

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

x	-2	-1	0	1	2
y	-8	-1		1	

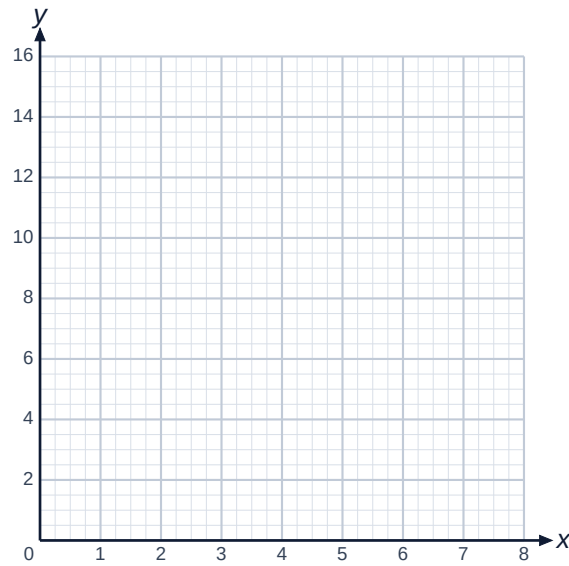


Q18

[4 marks]

- (a) Complete the table of values for $y = \frac{8}{x}$.
- (b) On the grid, draw the graph of $y = \frac{8}{x}$ for values of x from 0.5 to 8.

x	0.5	1	2	4	8
y		8		2	1



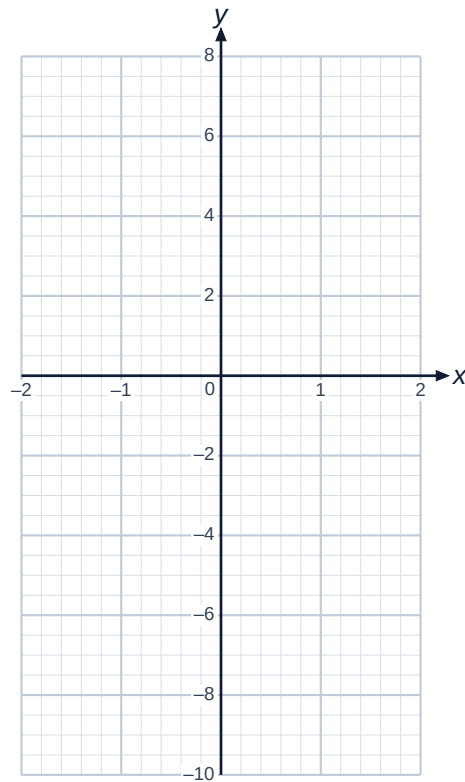
Q19

[4 marks]

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

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

x	-2	-1	0	1	2
y	-9	-2		0	



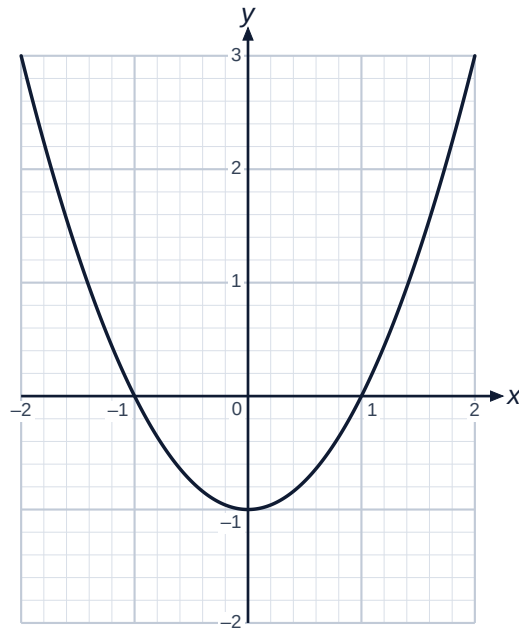
Q20

[3 marks]

The graph of $y = x^2 - 1$ is drawn on the grid.

(a) Use the graph to write down the roots of $x^2 - 1 = 0$.

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



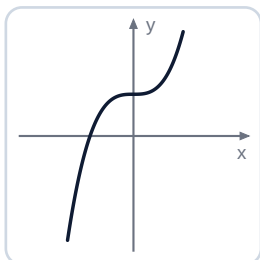
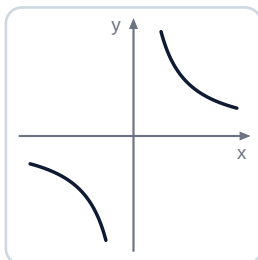
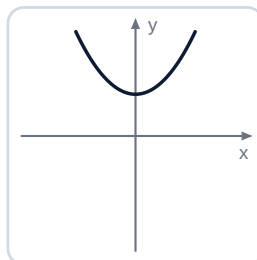
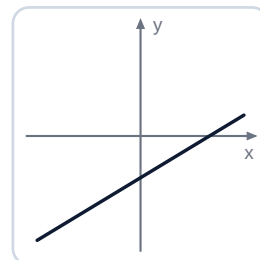
Q21

[3 marks]

Each sketch shows the graph of one of these equations.

1 $y = x - 2$ **2** $y = x^2 + 2$ **3** $y = \frac{4}{x}$ **4** $y = x^3 + 2$

Match each sketch A, B, C and D to the number of its equation.

**A****B****C****D**

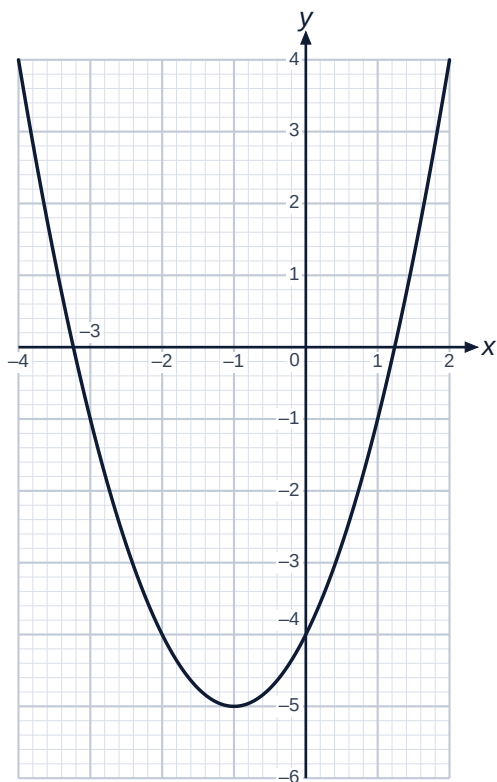
Q22

[4 marks]

The graph of $y = x^2 + 2x - 4$ is drawn on the grid.

(a) Use the graph to find estimates for the solutions of $x^2 + 2x - 4 = 0$.

(b) Use the graph to solve $x^2 + 2x - 4 = -2$.



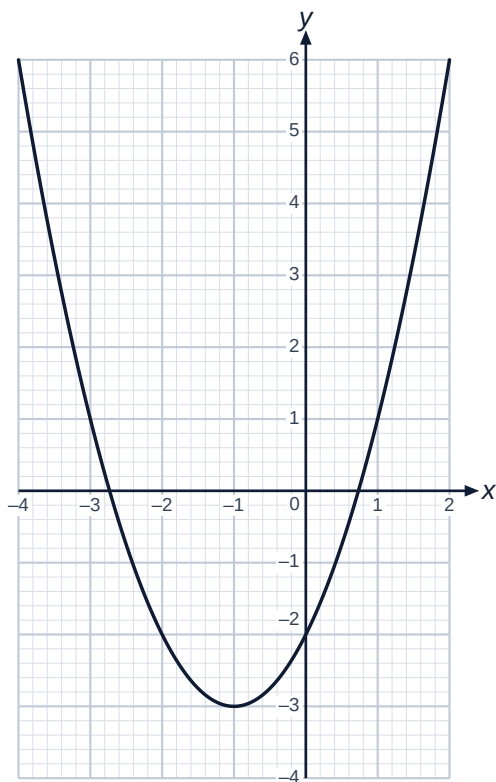
Q23

[4 marks]

The graph of $y = x^2 + 2x - 2$ is drawn on the grid.

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

(b) Use the graph to solve $x^2 + 2x - 2 = -1$.

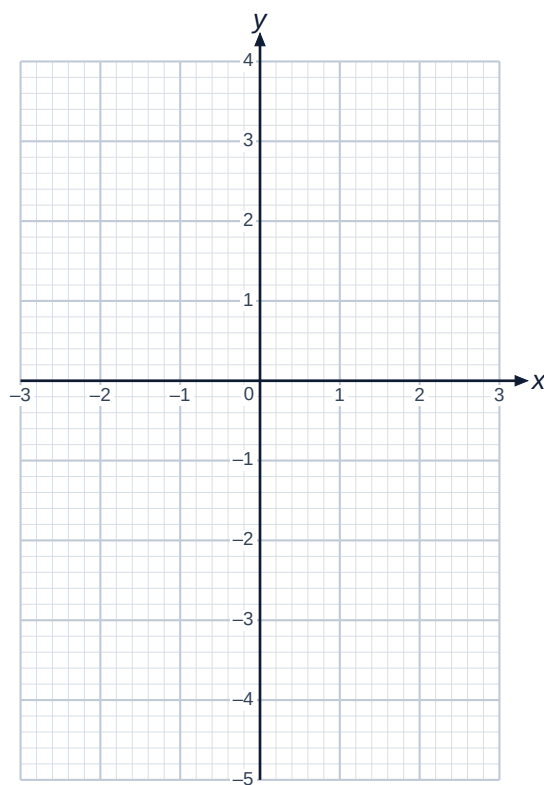


Q24

[6 marks]

- (a) Complete the table of values for $y = x^2 - 5$.
(b) On the grid, draw the graph of $y = x^2 - 5$ for values of x from -3 to 3 .
(c) Use your graph to estimate the solutions of $x^2 - 5 = 0$.

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

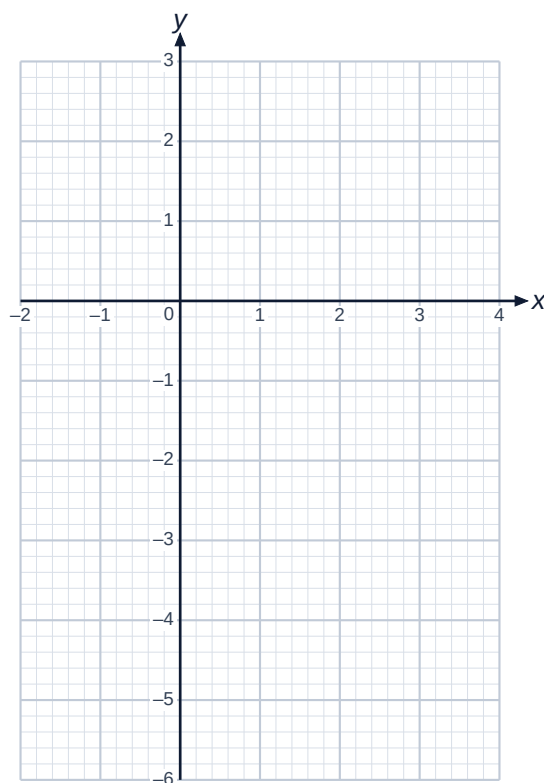


Q25

[6 marks]

- (a) Complete the table of values for $y = x^2 - 2x - 5$.
(b) On the grid, draw the graph of $y = x^2 - 2x - 5$ for values of x from -2 to 4 .
(c) Use your graph to estimate the solutions of $x^2 - 2x - 5 = 0$.

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

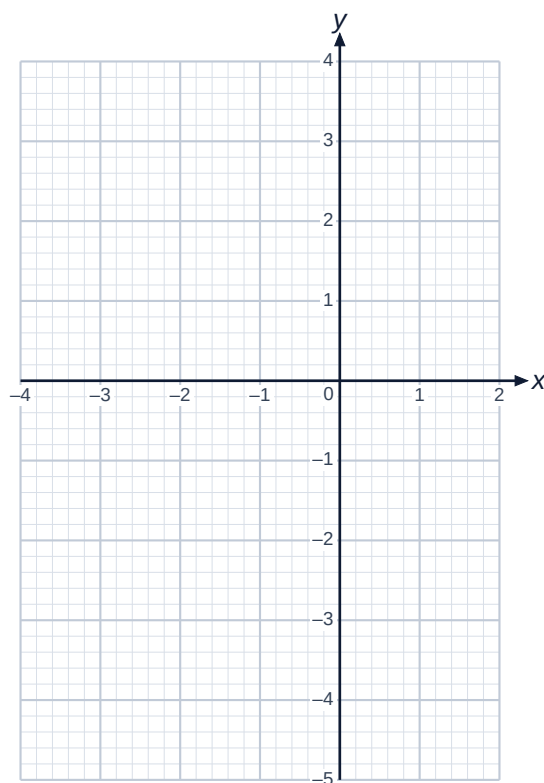


Q26

[6 marks]

- (a) Complete the table of values for $y = x^2 + 2x - 4$.
(b) On the grid, draw the graph of $y = x^2 + 2x - 4$ for values of x from -4 to 2 .
(c) Use your graph to estimate the solutions of $x^2 + 2x - 4 = 0$.

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



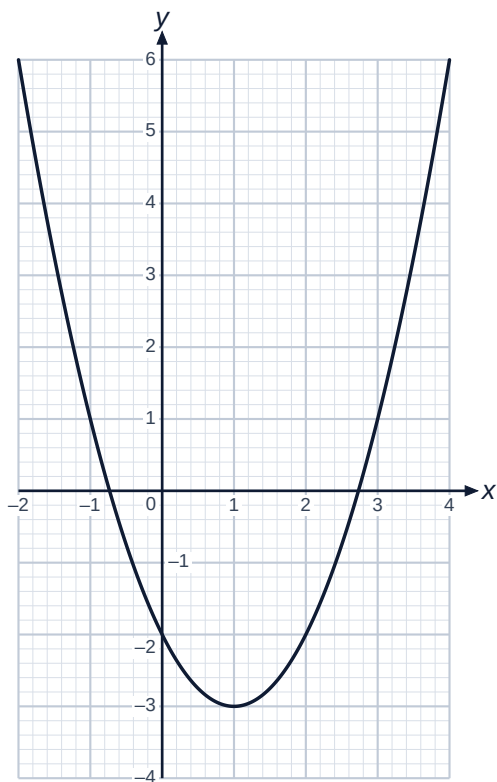
Q27

[4 marks]

The graph of $y = x^2 - 2x - 2$ is drawn on the grid.

(a) Use the graph to find estimates for the solutions of $x^2 - 2x - 2 = 0$.

(b) Use the graph to solve $x^2 - 2x - 2 = 2$.



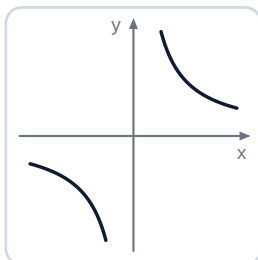
Q28

[3 marks]

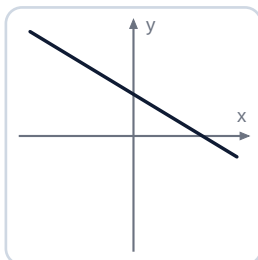
Each sketch shows the graph of one of these equations.

1 $y = -x^2 + 4$ **2** $y = \frac{4}{x}$ **3** $y = -x + 2$ **4** $y = x^3$

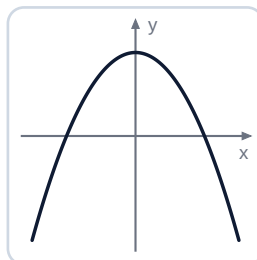
Match each sketch A, B, C and D to the number of its equation.



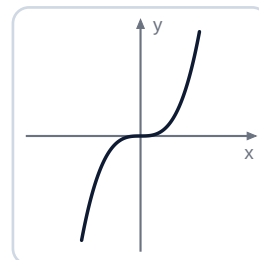
A



B



C



D

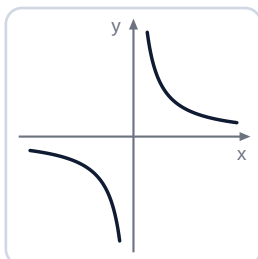
Q29

[3 marks]

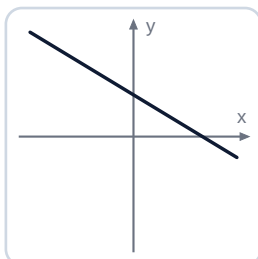
Each sketch shows the graph of one of these equations.

1 $y = -x + 2$ **2** $y = x^3$ **3** $y = x^2$ **4** $y = \frac{2}{x}$

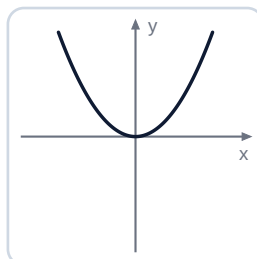
Match each sketch A, B, C and D to the number of its equation.



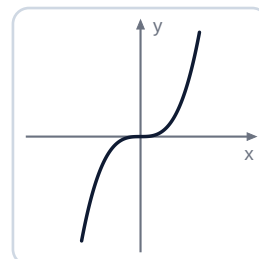
A



B



C



D

Q30

[4 marks]

The graph of $y = x^2 + 2x - 2$ is drawn on the grid.

- (a) Use the graph to find estimates for the solutions of $x^2 + 2x - 2 = 0$.
(b) Use the graph to solve $x^2 + 2x - 2 = 4$.

