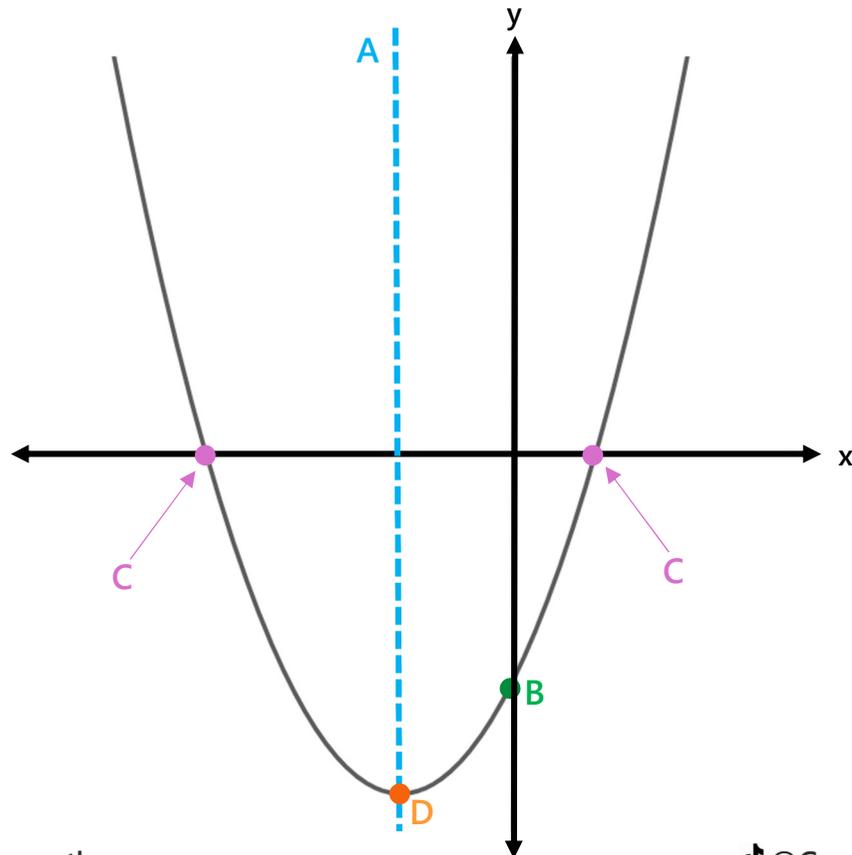


QUADRATIC GRAPHS

- 1) A quadratic graph is shown below. Use the graph and table below to match each key point to a letter.

Key Point	Letter
Roots	C
Turning point	D
Line of symmetry	A
y-intercept	B



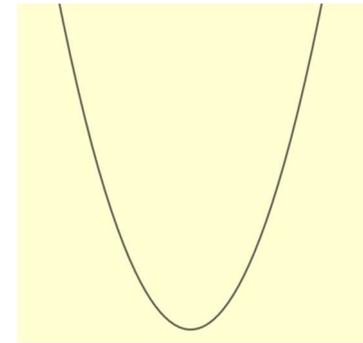
- 2) A quadratic equation is of the form

$$y = ax^2 + bx + c$$

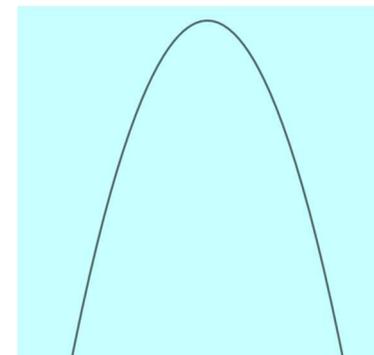
Complete the following sentences using one of the symbols:

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- a. When $a > 0$, the curve makes a U-shape (opens upwards).



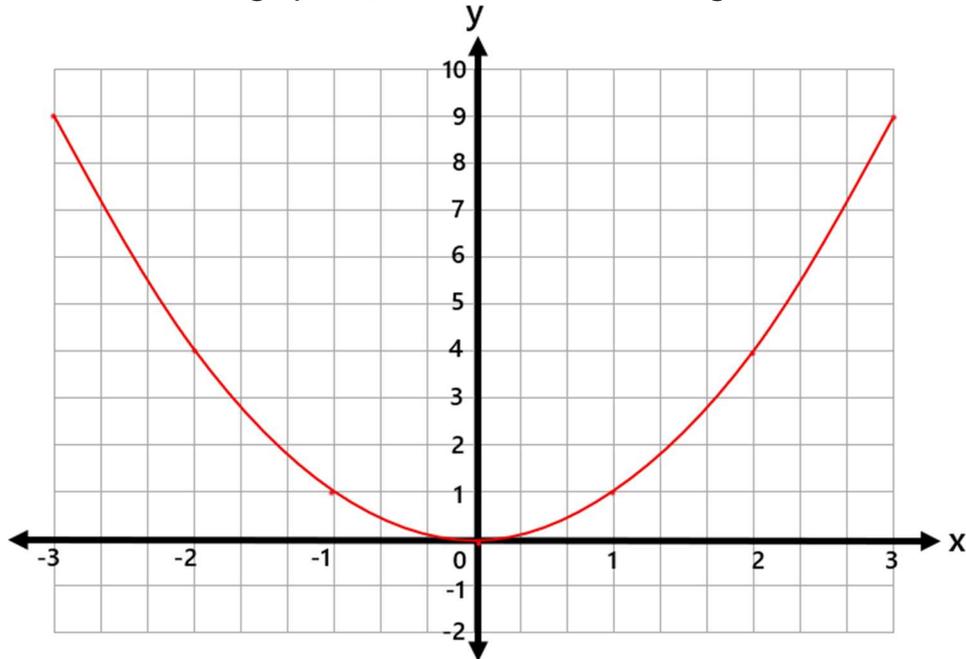
- b. When $a < 0$, the curve makes an n-shape (opens downwards).



3) Complete the table of values for the equation $y = x^2$

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

a. Draw the graph of $y = x^2$ on the coordinate grid.



b. State the coordinates of the turning point.

$(0, 0)$

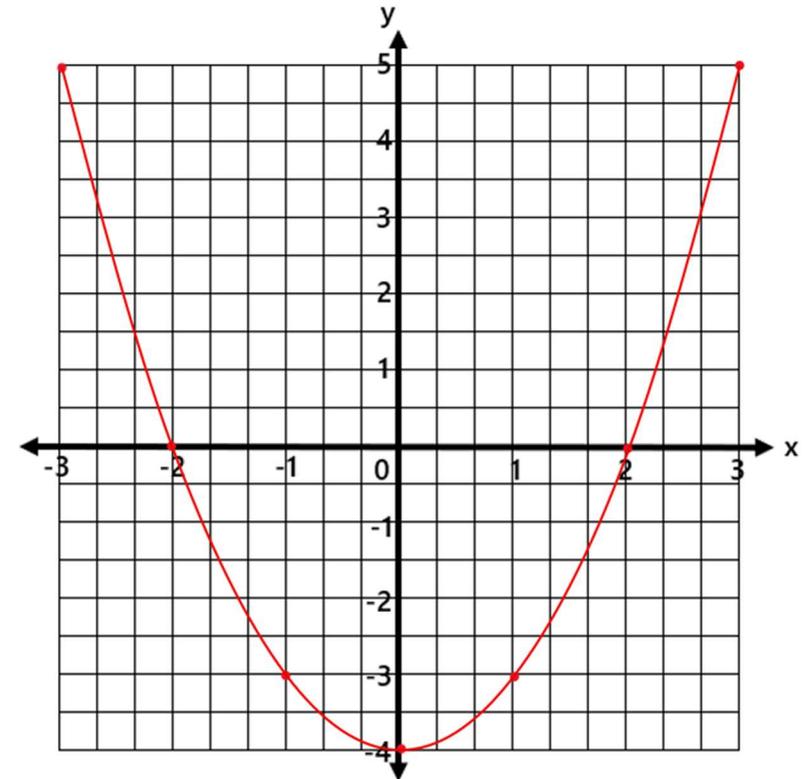
c. State the line of symmetry of the graph $y = x^2$

$x = 0$

4) Complete the table of values for the equation $y = x^2 - 4$

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

a. Draw the graph of $y = x^2 - 4$ on the coordinate grid.



b. State the coordinates of the turning point.

$(0, -4)$

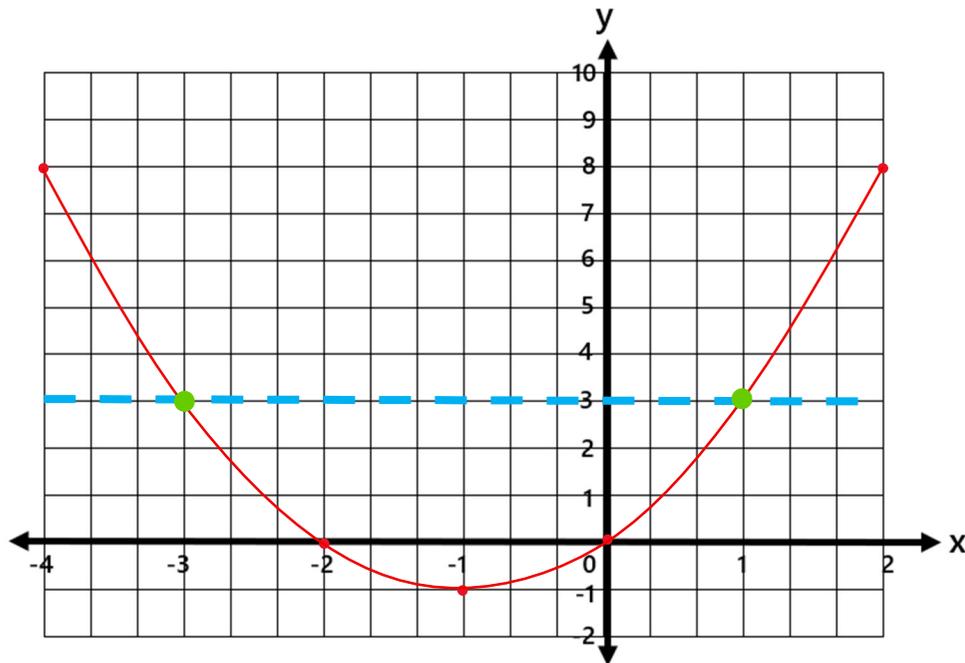
c. State the roots of the equation $y = x^2 - 4$

$x = -2$ and $x = 2$

5) Complete the table of values for the equation $y = x^2 + 2x$

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

a. Draw the graph of $y = x^2 + 2x$ on the coordinate grid.

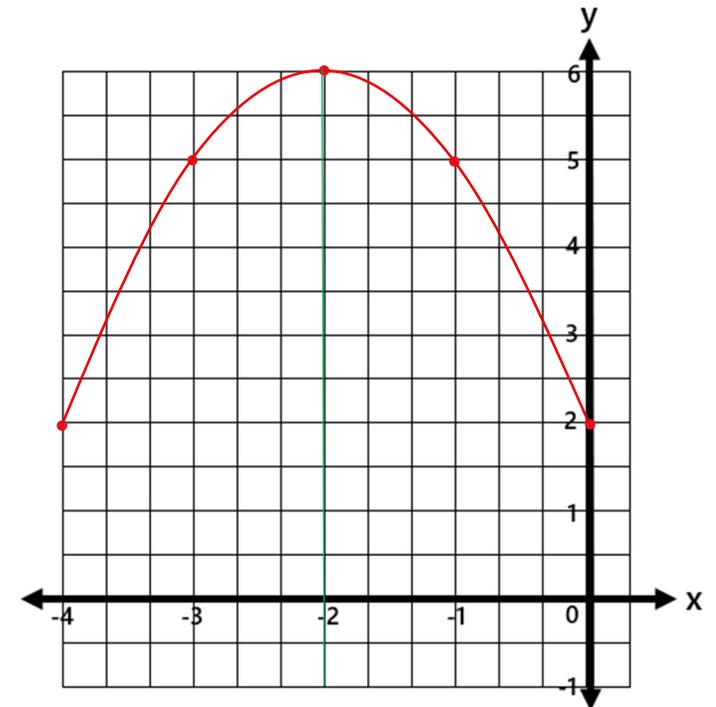


- b. State the coordinates of the y-intercept.
(0, 0)
- c. State the coordinates of the turning point.
(-1, -1)
- d. Use the graph to state the solutions to the equation $x^2 + 2x = 3$.
 $x = -3$ and $x = 1$

6) Complete the table of values for the equation $y = -x^2 - 4x + 2$

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

a. Draw the graph of $y = -x^2 - 4x + 2$ on the coordinate grid.

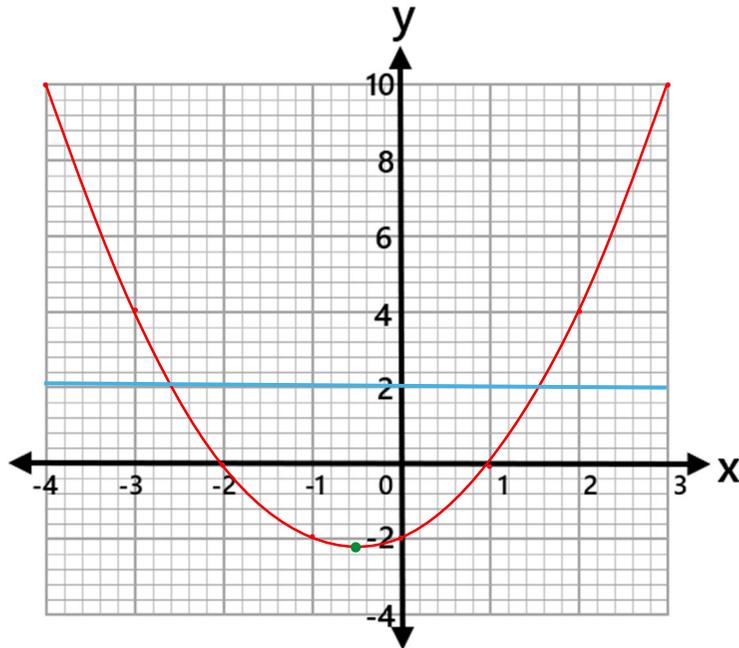


- b. State the coordinates of the y-intercept.
(0, 2)
- c. State the coordinates of the turning point.
(-2, 6)
- d. State the line of symmetry of the graph $y = -x^2 - 4x + 2$
 $x = -2$

7) Complete the table of values for the equation $y = x^2 + x - 2$

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

a. Draw the graph of $y = x^2 + x - 2$ on the coordinate grid.



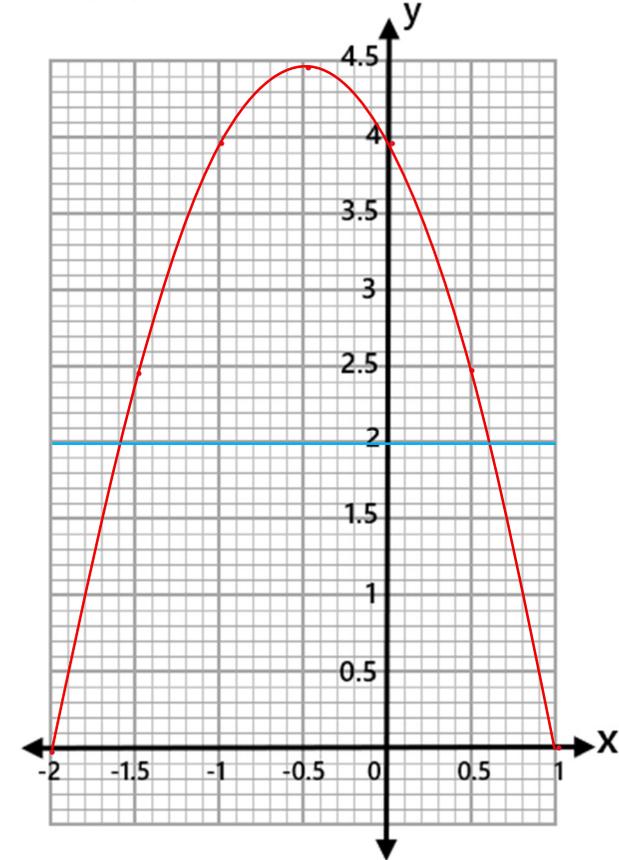
b. Use your graph to estimate the turning point of $y = x^2 + x - 2$
 (-0.5, -2.1)

c. Use the grid to estimate the solutions to the equation
 $y = x^2 + x - 2 = 2$
 $x = -2.6$ and $x = 1.6$
 (answers in range [-2.8, -2.4] and [1.4, 1.8])

8) Complete the table of values for the equation $y = 4 - 2x - 2x^2$

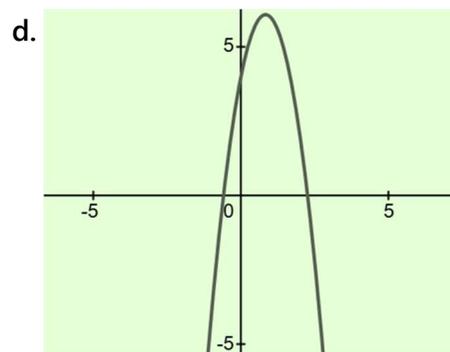
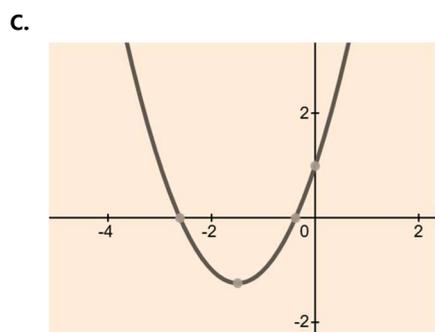
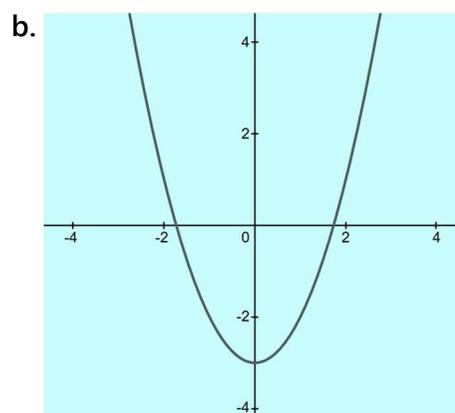
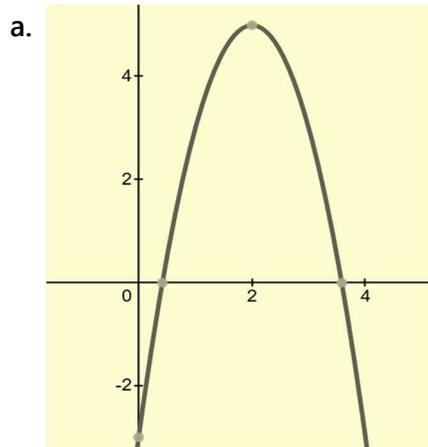
x	-2	-1.5	-1	-0.5	0	0.5	1
y	0	2.5	4	4.5	4	2.5	0

a. Draw the graph of $y = 4 - 2x - 2x^2$ on the coordinate grid.



b. Use the grid to estimate the solutions to the equation
 $4 - 2x - 2x^2 = 2$
 $x = -1.6$ and $x = 0.6$
 (answers in range [-1.7, -1.4] and [0.4, 0.7])

9) Match the following graphs with an equation in the table.



Use the coefficient of x^2 and the y-intercept to differentiate between the graphs.

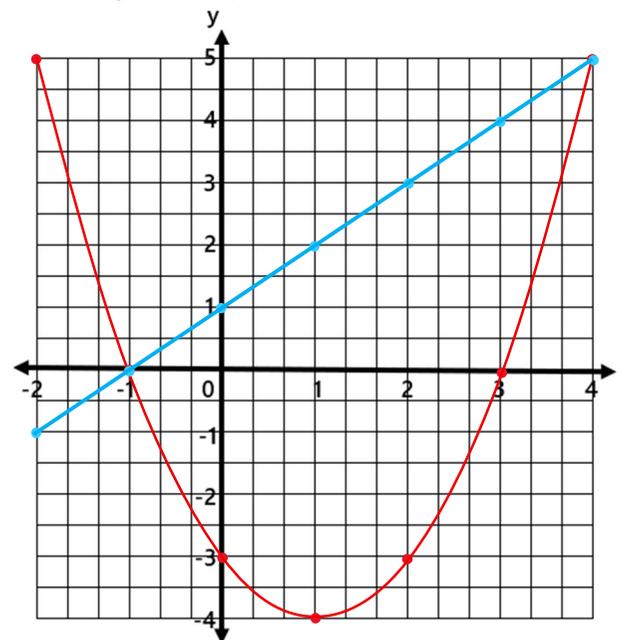
Equation	Graph
$y = x^2 - 3$	b
$y = x^2 + 3x + 1$	c
$y = -3x^2 + 5x + 4$	d
$y = -2x^2 + 8x - 3$	a

Challenge

10) Complete the table of values for the equation $y = x^2 - 2x - 3$

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

a. Draw the graph of $y = x^2 - 2x - 3$ on the coordinate grid.



b. Use the grid above to identify the solutions to the equation

$$x^2 - 2x - 3 = x + 1$$

Plot the straight-line equation $y = x + 1$. The solutions are the points of intersection.

$$x = -1 \text{ and } x = 4$$

c. Explain why there are no solutions to the equation

$$x^2 - 2x - 3 = -10$$

The line $y = -10$ is a straight horizontal line beneath the turning point of the graph of $y = x^2 - 2x - 3$. Hence there are no points of intersection and no solutions.