

GCSE Maths: Tables of values and plotting quadratic graphs (Higher): answers

GCSE Maths - Quadratic and Other Graphs - Higher - Lesson 13.1

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch13-quadratic-other-graphs/higher/tables-of-values-and-plotting-quadratic-graphs/

Exercise 13A Tables of values and plotting quadratics Non-calculator

1 Work out the value of y for each rule when x takes the value shown. Show the calculation.

(a) $y = x^2$ when $x = -2$

Answer: $y = 4$

(b) $y = x^2 + 3$ when $x = -1$

Answer: $y = 4$

(c) $y = x^2 - 5$ when $x = 3$

Answer: $y = 4$

(d) $y = 2x^2$ when $x = -2$

Answer: $y = 8$

(e) $y = x^2 + x$ when $x = -3$

Answer: $y = 6$

(f) $y = x^2 - 3x + 1$ when $x = -2$

Answer: $y = 11$

2 Complete the table of values for $y = x^2 + 2$. Some values are already filled in.

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

Answer:

x	-3	-2	-1	0	1	2	3
y	11	6	3	2	3	6	11

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

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

Answer:

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

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

x	-3	-2	-1	0	1	2
y						

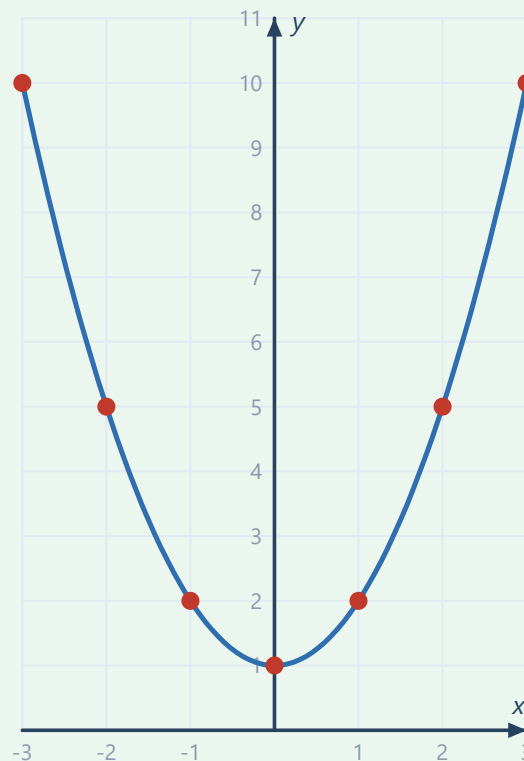
Answer:

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

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

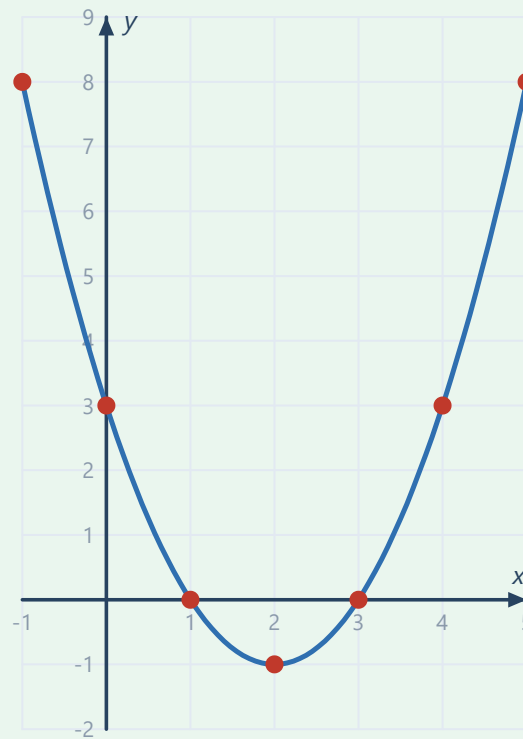
Answer: Points: (-3, 10), (-2, 5), (-1, 2), (0, 1), (1, 2), (2, 5), (3, 10). U-shaped, with its turning point at (0, 1).



- 6 (a) Complete the table of values for $y = x^2 - 4x + 3$. (b) Draw the graph of $y = x^2 - 4x + 3$ for values of x from -1 to 5 .

x	-1	0	1	2	3	4	5
y							

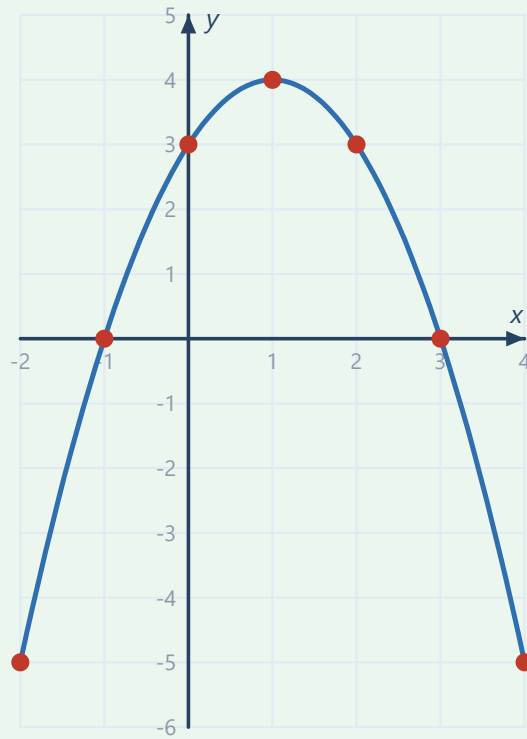
Answer: Points: $(-1, 8)$, $(0, 3)$, $(1, 0)$, $(2, -1)$, $(3, 0)$, $(4, 3)$, $(5, 8)$. U-shaped, with its turning point at $(2, -1)$.



- 7 (a) Complete the table of values for $y = -x^2 + 2x + 3$. (b) Draw the graph of $y = -x^2 + 2x + 3$ for values of x from -2 to 4 .

x	-2	-1	0	1	2	3	4
y							

Answer: Points: $(-2, -5)$, $(-1, 0)$, $(0, 3)$, $(1, 4)$, $(2, 3)$, $(3, 0)$, $(4, -5)$. n-shaped, with its turning point at $(1, 4)$.



- 8 Aisha is working out y when $x = -3$ for $y = x^2 + 2$. She writes: " $(-3)^2 = -9$, so $y = -9 + 2 = -7$." Explain her mistake and work out the correct value.

Answer: 11

- 9 For each point, say whether it lies on the graph of $y = x^2 - 3$.

(a) $(2, 1)$

Answer: Yes

(b) $(-1, -4)$

Answer: No

(c) $(0, -3)$

Answer: Yes

(d) $(-3, 6)$

Answer: Yes

- 10 Without drawing the graph, say whether each quadratic graph is U-shaped or n-shaped.

(a) $y = x^2 + 5$

Answer: U-shaped

(b) $y = -x^2 + 5$

Answer: n-shaped

(c) $y = -x^2 + 3$

Answer: n-shaped

(d) $y = x^2 - 5x$

Answer: U-shaped

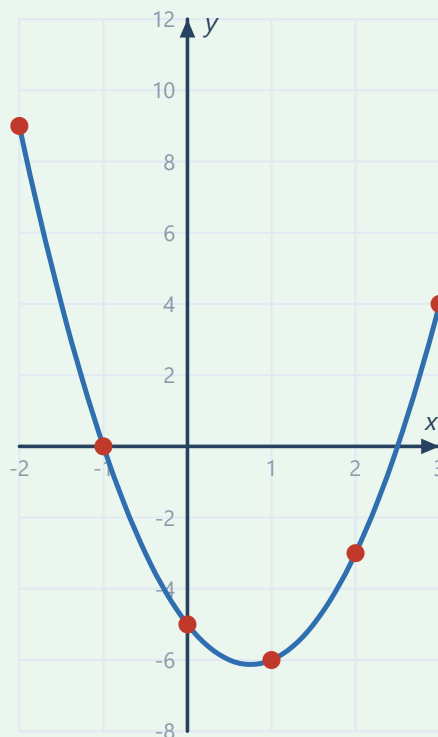
- 11 The point $(k, 11)$ lies on the graph of $y = x^2 + 2$. Work out the two possible values of k .

Answer: $k = 3$ or $k = -3$

- 12 (a) Complete the table of values for $y = 2x^2 - 3x - 5$. (b) Draw the graph of $y = 2x^2 - 3x - 5$ for values of x from -2 to 3 .

x	-2	-1	0	1	2	3
y						

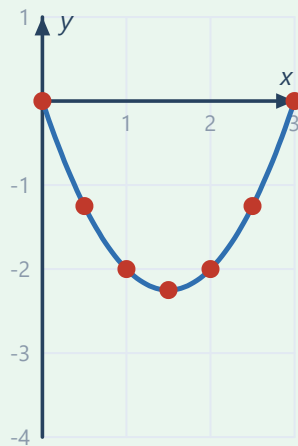
Answer: Points: $(-2, 9)$, $(-1, 0)$, $(0, -5)$, $(1, -6)$, $(2, -3)$, $(3, 4)$. U-shaped, with its turning point at $(0.75, -6.125)$.



- 13 (a) Complete the table of values for $y = x^2 - 3x$. (b) Draw the graph for values of x from 0 to 3. (c) Write down the coordinates of the turning point.

x	0	0.5	1	1.5	2	2.5	3
y							

Answer: Points: (0, 0), (0.5, -1.25), (1, -2), (1.5, -2.25), (2, -2), (2.5, -1.25), (3, 0). U-shaped, with its turning point at (1.5, -2.25).



Turning point (1.5, -2.25).

- 14** Explain why the graph of $y = x^2$ never goes below the x -axis.

Answer: Squares are never negative

- 15** Ben draws the graph of $y = x^2 - 2x - 3$ by joining his plotted points with a ruler. Explain why this is wrong.

Answer: The graph is a smooth curve, not straight pieces

- 16** (a) Complete the table of values for $y = x^2 - 6x + 8$. (b) The point (1, 3) is on the graph. Use the symmetry of the table to write down the x -value of another point with $y = 3$. (c) Write down the equation of the line of symmetry. (d) Explain how you know.

x	0	1	2	3	4	5	6
y							

- (a) Complete the table.

Answer:

x	0	1	2	3	4	5	6
y	8	3	0	-1	0	3	8

- (b) Another point with $y = 3$.

Answer: $x = 5$

- (c) Line of symmetry.

Answer: $x = 3$

- (d) Explain.

Answer: The table repeats in reverse about $x = 3$

