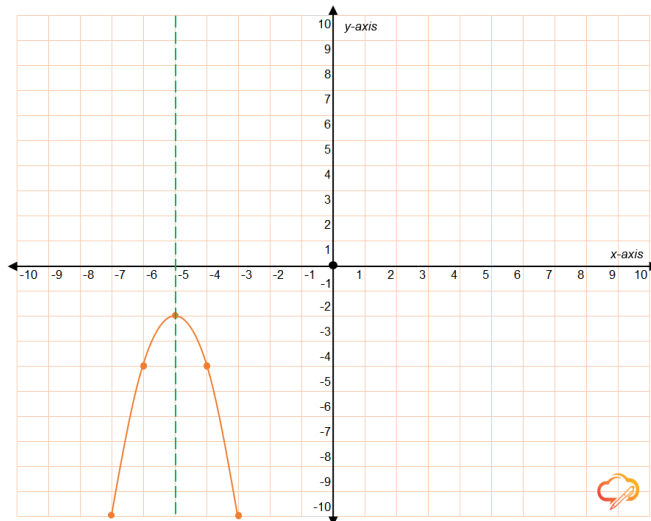




Graphing Parabolas (Vertex Form)

Parabolas

Parabolas are symmetrical, open U-shaped curves.



The function or equation of a parabola can be expressed using two forms:

STANDARD FORM

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

where a parabola with a positive “a” value curves up and a negative “a” curves down. “a” values also affect steepness.

VERTEX FORM

$$y = a(x - h)^2 + k$$

where (h, k) is the vertex point

Graphing using VERTEX FORM

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

STEP ONE: Write what you know.

$$a = -2 \quad h = -5 \quad k = -2$$

The vertex (h, k) is **(-5, -2)**.

The parabola will curve down as “a” is negative in this equation.

STEP TWO: Plot the vertex (-5, -2) on the axis of symmetry at $x = -5$.

STEP THREE: Fill in a table of values using two points around the vertex x-value to get five coordinate pairs.

x	-7	-6	-5	-4	-3
y	-10	-4	-2	-4	-10

STEP FOUR: Graph the parabola using these points (see graph above).

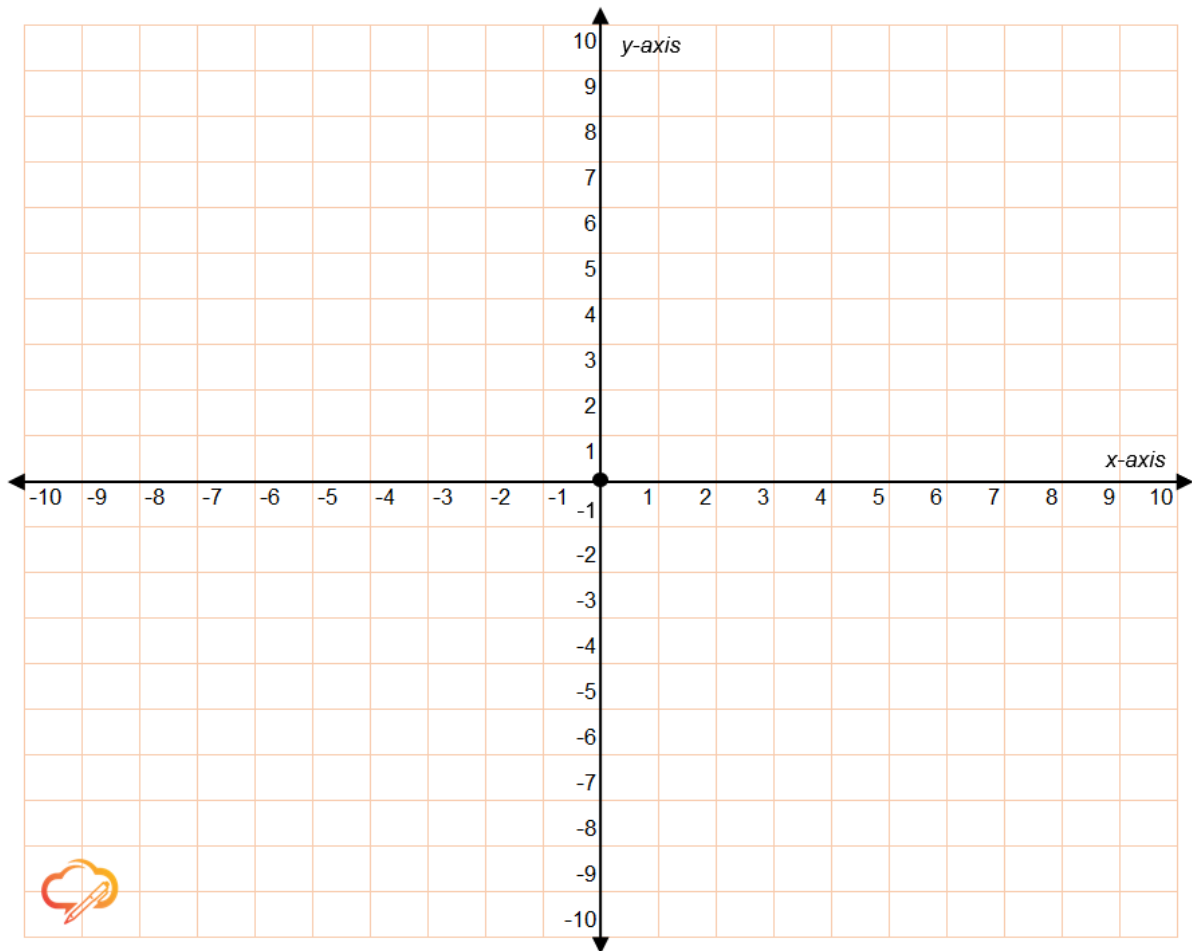


Instructions: Complete Steps 1 to 3 for the parabolas below. Use the space below for your working out.

1	$y = 2(x - 4)^2 - 1$	2	$y = -4(x - 6)^2 + 9$
3	$y = -(x + 6)^2 + 3$	4	$y = \frac{1}{2}(x + 3)^2 - 7$



Instructions: Graph the parabolas on the Cartesian plane below.

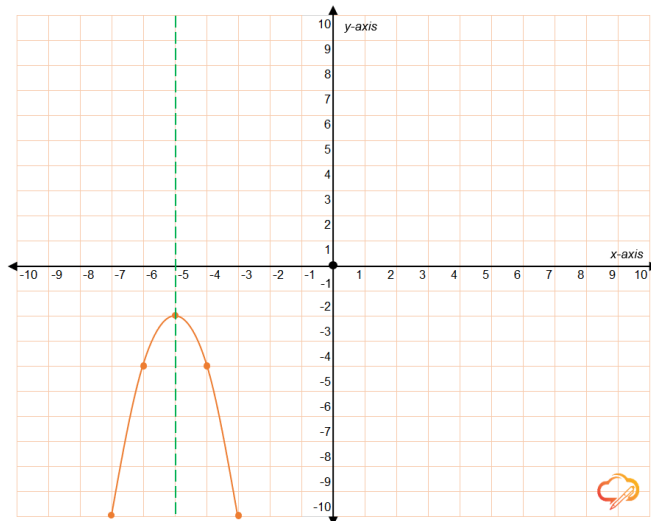




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Instructions: Complete Steps 1 to 3 for the parabolas below. Use the space below for your working out.

1	$y = 3(x - 2)^2 - 5$	2	$y = -\frac{1}{4}(x - 2)^2 + 1$
3	$y = -2(x + 4)^2 + 5$	4	$y = \frac{1}{2}(x + 7)^2 - 2$



Instructions: Graph the parabolas on the Cartesian plane below.

