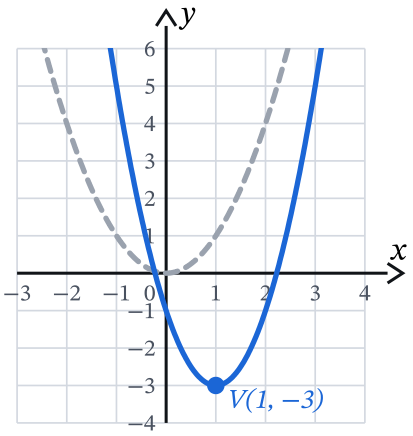
Name _____ Date _____

Vertex Form

Example



$f(x) = 2(x-1)^2 - 3$

We make $y = x^2$ narrower ($a = 2$), shift it 1 **right** and 3 **down**.

Vertex $V(1, -3)$, axis of symmetry $x = 1$, opens upwards.

Remember

Vertex form: $f(x) = a(x-p)^2 + q$. The vertex is $V(p, q)$, the axis of symmetry is the line $x = p$, and a decides how the parabola opens.

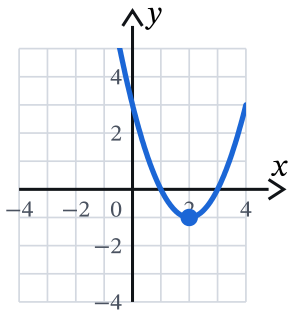
1 ON YOUR OWN Complete the table.

Function	a	Vertex	Axis of symmetry	Opens
$(x-4)^2 + 1$	☐	$V($☐,☐$)$	$x =$ ☐	up / down
$-(x+2)^2 + 5$	☐	$V($☐,☐$)$	$x =$ ☐	up / down
$3(x-1)^2 - 2$	☐	$V($☐,☐$)$	$x =$ ☐	up / down
$-\frac{1}{2}(x+3)^2$	☐	$V($☐,☐$)$	$x =$ ☐	up / down
$2x^2 - 7$	☐	$V($☐,☐$)$	$x =$ ☐	up / down
$-(x-6)^2$	☐	$V($☐,☐$)$	$x =$ ☐	up / down

Names (pair) _____ Date _____

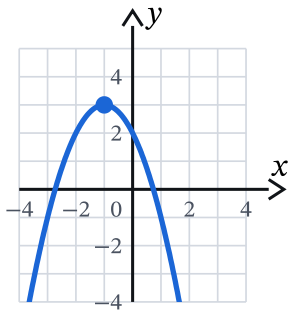
2 IN PAIRS **Formula from the graph.** One student reads the vertex and one more point, the other writes the formula in vertex form. Swap roles.

A



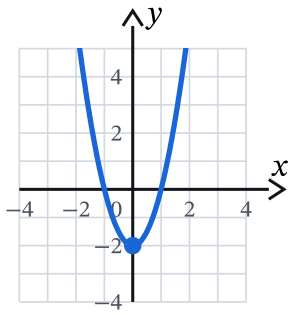
$f(x) =$ ☐

B



$f(x) =$ ☐

C



$f(x) =$ ☐

3 ON YOUR OWN Write the formula in vertex form if the vertex and one point of the parabola are given.

$V(1, 2)$, point $(2, 5)$: $f(x) =$ ☐

$V(-2, 0)$, point $(0, -8)$: $f(x) =$ ☐

The Parabola app · otooly.com/parabola-explorer

Mode **Predict and check**: choose *Graph → formula* and the tasks $a(x - p)^2 + q$.

★ ON YOUR OWN **Exit card.** $f(x) = -(x - 3)^2 + 4$: $V($☐, ☐$)$, opens **up** / **down**