

Vertex Form of a Quadratic

SWBAT graph a quadratic equation in vertex form.

Vertex Form:

Where (h, k) is the vertex

The vertex form of a quadratic equation is given by _____

(h, k) is the _____ of the _____ and $x = h$ is _____

H represents _____

K represents _____

When working with the **vertex form** of a quadratic function,

$$h = \frac{-b}{2a} \text{ and } k = f(h).$$

The "a" and "b" referenced here refer to $f(x) = ax^2 + bx + c$.

Graphing an equation in Vertex Form

Example 1: State the vertex of the following functions.

a) $y = (x - 2)^2 + 1$

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

c) $y = -(x + 6)^2$

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

Example 2: Write the equation in vertex form with the given information.

a) Vertex: $(-6, 5)$; $a = 12$

b) Vertex: $(4, -2)$; $a = -3$

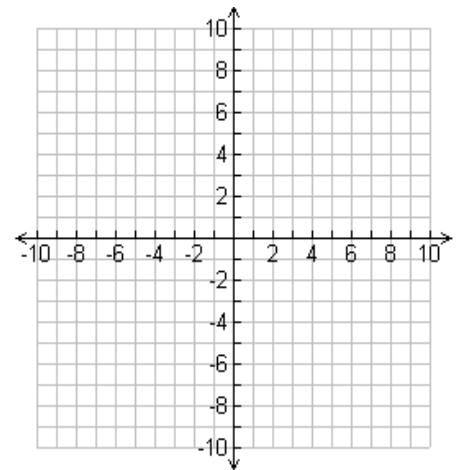
c) Vertex: $(-3, -8)$; $a = 1$

d) Vertex: $(7, 2)$; $a = .06$

e) Vertex: $(0, -8)$; $a = 12$

f) Vertex: $(-6, 0)$; $a = -9$

x	y



Example 3: Graph each of the following.

a) $y = 1/2(x - 6)^2 - 3$

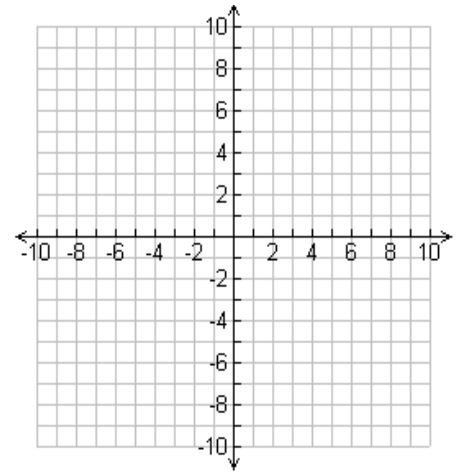
Opens: _____

AOS: _____

Vertex: _____

Y-Int: _____

x	y



b) $y = -3(x + 4)^2 + 7$

Opens: _____

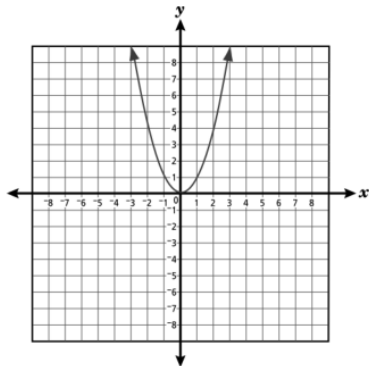
AOS: _____

Vertex: _____

Y-Int: _____

EOC Practice: Complete the following EOC-type questions for class credit.

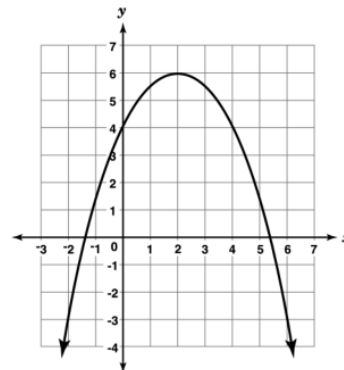
Study the graph of $y = x^2$, shown below.



If the graph is moved up 3 units, what equation will it represent?

- *a) $y = x^2 + 3$ b) $y = (x + 3)^2$ c) $y = (x - 3)^2$ d) $y = x^2 - 3$

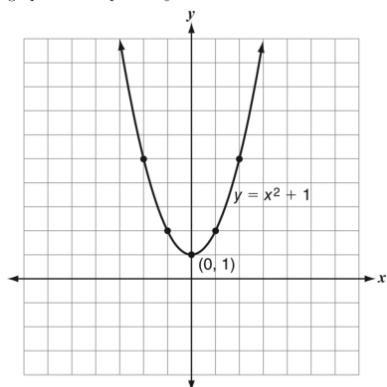
Look at the graph below.



Which of these terms describes the y -coordinate of the point (2, 6)?

- a) zero b) intercept c) minimum *d) maximum

Beth and Jacob are graphing two equations on a coordinate grid. Beth has graphed the equation $y = x^2 + 1$.



If Jacob graphs $y = x^2 + 3$, where will his graph be in relation to the graph Beth made?

- *a) 2 units up
- b) 3 units up
- c) 2 units to the left
- d) 3 units to the right

Which of the following statements describes the graph of the parabola with the equation $y = -3x^2$?

- a) The graph opens upward, and the vertex is $(0, 0)$.
- b) The graph opens upward, and the vertex is $(0, -3)$.
- *c) The graph opens downward, and the vertex is $(0, 0)$.
- d) The graph opens downward, and the vertex is $(0, -3)$.

In which table is y a nonlinear function of x ?

a)

x	y
1	5
2	6
3	7

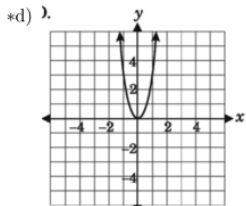
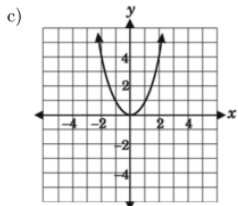
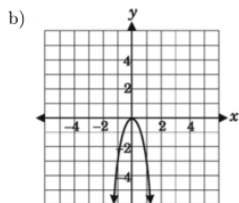
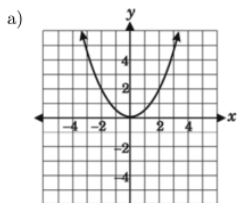
*b)

x	y
1	4
2	7
3	12

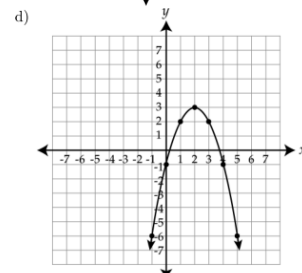
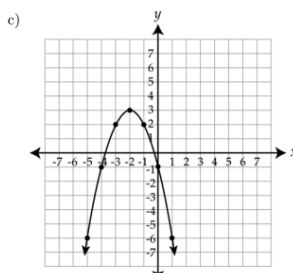
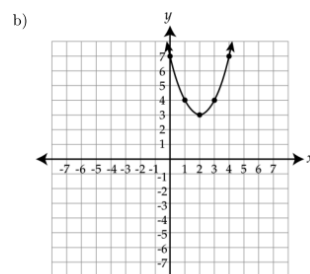
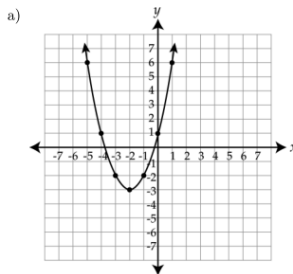
c)

x	y
1	2
2	4
3	6

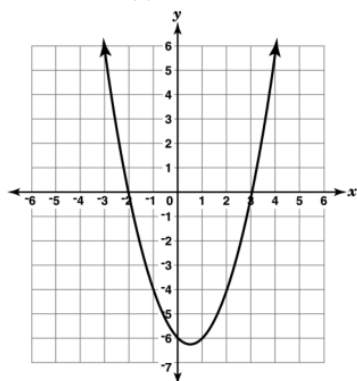
Each graph below represents an equation of the form $y = ax^2$. Which graph represents the equation with the greatest value for a ?



Which graph represents the function $y = -(x - 2)^2 + 3$?



The function $f(x) = x^2 - x - 6$ is graphed on the grid below.



What are the zeros of this function?

- *a) -2 and 3
- b) 0 and -6
- c) $\frac{1}{2}$ and $-6\frac{1}{4}$
- d) $-\frac{1}{2}$ and $6\frac{1}{4}$