

Day 8: Writing Equations in Vertex Form

Date _____

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- 1) Remember in the last unit how we were able to write the equation of a quadratic function given the zeros and a point? Let's Review...

Write the quadratic equation for the following.

- 2) Zeros of $x = -2$ and $x = 4$, and goes through the point $(2, 4)$

$$y = A(x+2)(x-4)$$

$$4 = A(2+2)(2-4)$$

$$4 = A(4)(-2)$$

$$4 = A(-8)$$

$$-\frac{1}{2} = A$$

$$y = -\frac{1}{2}(x+2)(x-4)$$

- 3) Zeros of $x = -2$ and $x = 2$, and goes through the point $(0, 8)$

$$y = A(x+2)(x-2)$$

$$8 = A(0+2)(0-2)$$

$$8 = A(2)(-2)$$

$$8 = A(-4)$$

$$-2 = A$$

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

What if we are given different critical points?

- 4) Determine the equation of the quadratic function that has a vertex of $(-4, -8)$ and passes through the point $(-2, -5)$.

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

(h, k)

Step 1: Write the equation in vertex form using the vertex and leaving "A" as the leading coefficient

$$y = A(x - (-4))^2 + -8$$

$$-5 = A(-2+4)^2 - 8$$

$$-5 = A(2)^2 - 8$$

Step 2: Solve for "A" by substituting the point in for x and y

$$-5 = A(4) - 8$$

$$+8$$

$$\frac{3}{4} = A\left(\frac{4}{4}\right)$$

$$\frac{3}{4} = A$$

Step 3: Rewrite the equation replacing the "A"

$$y = \frac{3}{4}(x+4)^2 - 8$$

Write the quadratic equation for the following in Vertex Form.

- 5) Vertex $(1, 6)$ and goes through the point $(2, 4)$

$$y = A(x - 1)^2 + 6$$

$$4 = A(2 - 1)^2 + 6$$

$$4 = A(1)^2 + 6$$

$$\frac{-6}{-6} = A(1)$$

$$-2 = A$$

$$y = -2(x - 1)^2 + 6$$

- 6) Vertex $(3, -5)$ and goes through the point $(7, -3)$

$$y = A(x - 3)^2 - 5$$

$$-3 = A(7 - 3)^2 - 5$$

$$-3 = A(4)^2 - 5$$

$$\frac{+5}{+5} = A(16)$$

$$\frac{1}{8} = A$$

$$y = \frac{1}{8}(x - 3)^2 - 5$$

- 7) Vertex $(1, -5)$ and goes through the point $(3, 1)$

$$y = A(x - 1)^2 - 5$$

$$1 = A(3 - 1)^2 - 5$$

$$\frac{+5}{+5} = A(2)^2$$

$$6 = A(4)$$

$$\frac{6}{4} = A = \frac{3}{2}$$

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

- 8) Vertex $(3, 6)$ and goes through the point $(1, 1)$

- 9) Vertex $(2, 3)$ and goes through the point $(1, -5)$

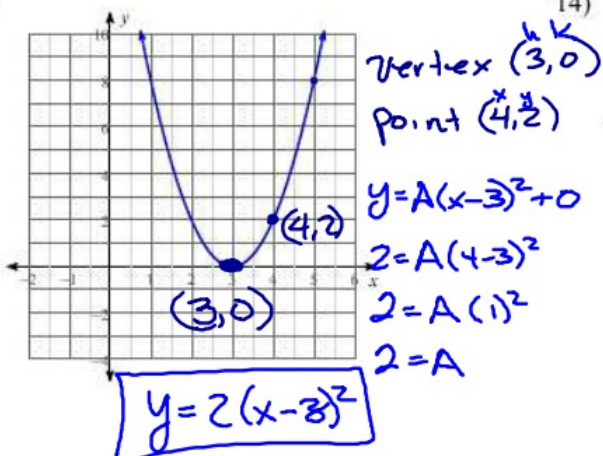
10) Vertex $(-4, 3)$ and goes through the point $(-2, 1)$

11) Vertex $(3, 5)$ and goes through the point $(2, 2)$

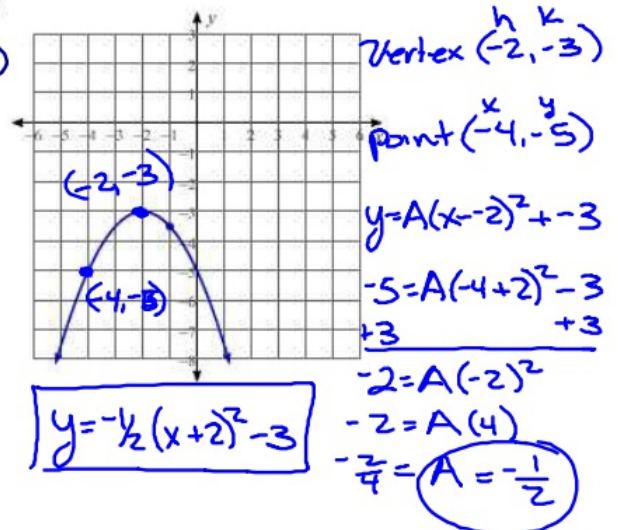
12) Vertex $(1, 4)$ and goes through the point $(3, -4)$

Write the quadratic equation for the following graph in Vertex Form.

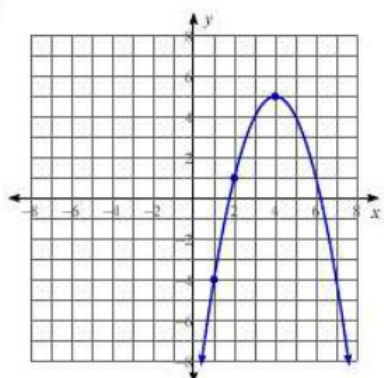
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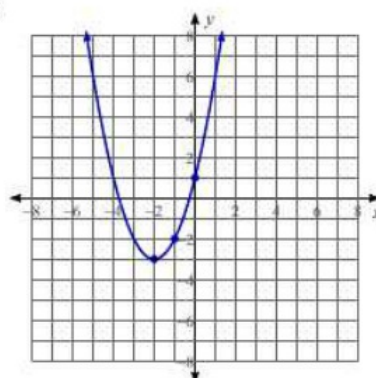
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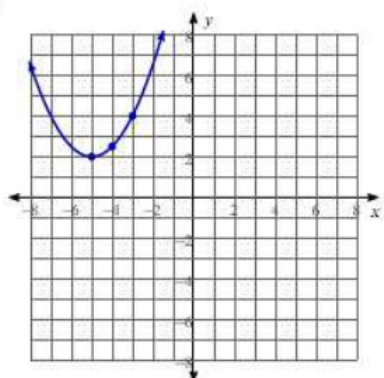
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16)



17)



18)

