

Day 4: Writing Equations in Factored Form

Date _____

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- 1) Now that we know how to graph quadratics from Factored Form, we can work backwards and write the equation if we are given the x -intercepts (also called zeros) and one other point on the parabola.

Why do we need another point on the parabola? Why isn't knowing the zeros enough?

need a solution

Determine the equation of a quadratic with the given information.

* factored form

$$y = A(x+m)(x+n)$$

- 2) Zeros $x = 2$ and $x = -3$ and goes through the point $(0, -4)$. Solution:

$$(x-2)(x+3)$$

*remember that the zeros are the x -intercepts.

Step 1: Write the zeros as factors.

$$y = A(x-2)(x+3)$$

Step 2: Make it an equation using "A" as the leading coefficient.

$$-4 = A(0-2)(0+3)$$

Step 3: Solve for "A" by substituting in the point for x and y .

$$-4 = A(-2)(+3)$$

$$-4 = A\left(\frac{-6}{-6}\right)$$

$$\frac{-4}{-6} = A$$

Step 4: Rewrite the equation replacing the "A"

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

Write the quadratic equation for the following in Factored Form.

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

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

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

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

$$\frac{4}{-8} = A\left(\frac{-8}{-8}\right)$$

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

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

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

$$y = A(x+m)(x+n)$$

- 5) Zeros of $x = 3$ and $x = 0$ and goes through the point $(-1, -6)$

$$y = A(x-3)(x+0) \Rightarrow y = -\frac{3}{2}(x-3)(x+0)$$

$$-6 = A(-1-3)(-1+0)$$

$$-6 = A(-4)(-1)$$

$$-\frac{6}{4} = A\left(\frac{4}{4}\right)$$

$$-\frac{3}{2} = A$$

- 6) Zeros of $x = -1$ and $x = 4$ and goes through the point $(2, 8)$

- 7) Zeros of $x = -5$ and $x = -2$ and goes through the point $(-3, -2)$

- 8) Zeros of $x = 1$ and $x = -3$ and goes through the point $(2, -10)$

$$y = A(x-1)(x+3) \Rightarrow y = -2(x-1)(x+3)$$

$$-10 = A(2-1)(2+3)$$

$$-10 = A(1)(5)$$

$$-\frac{10}{5} = A\left(\frac{5}{5}\right)$$

$$-2 = A$$

- 9) Zeros of $x = 1$ and $x = -3$ and goes through the point $(-4, -10)$

- 10) Zeros of $x = -2$ and $x = 1$ and goes through the point $(-6, 28)$

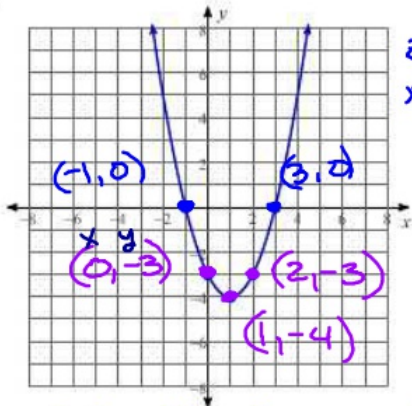
How can you write the equation of the parabola if you are given its graph?

11) Start by finding the x -intercept(s) on the graph so that you can write the factors.

Then we can use another point on the graph to find "A" and complete our equation.

Write the equation of the quadratic, in Factored Form, for the graph of the parabola given.

12)



zeros
 $x = -1$ $x = 3$

$$y = A(x+1)(x-3) \quad y = 1(x+1)(x-3)$$

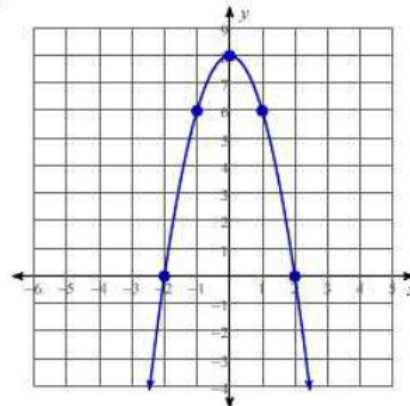
$$-3 = A(0+1)(0-3)$$

$$-3 = A(1)(-3)$$

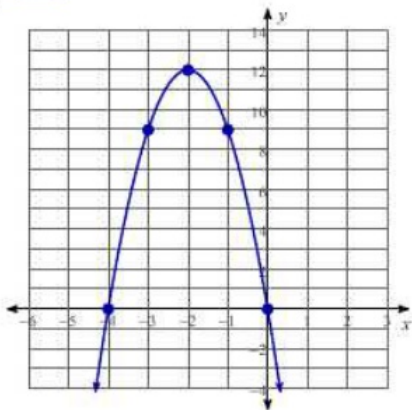
$$-3 = A(-3)$$

$$1 = A$$

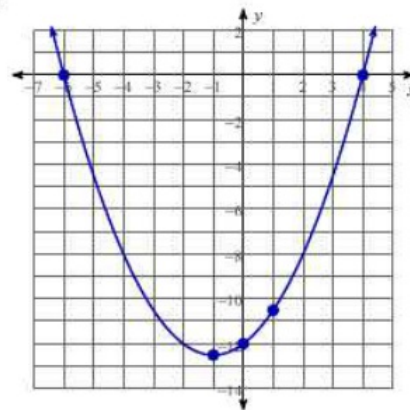
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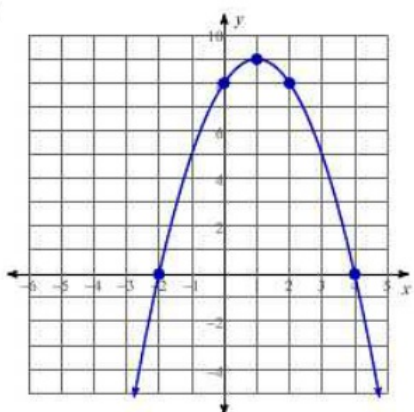
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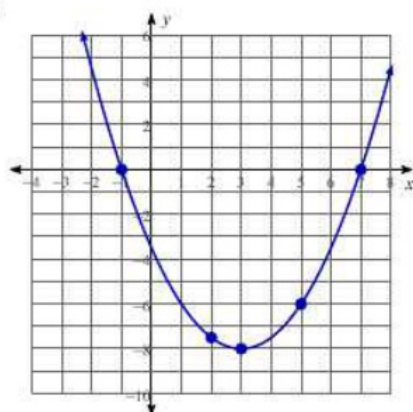
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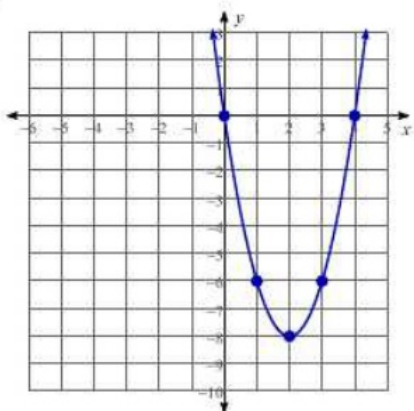
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17)



18)



19)

