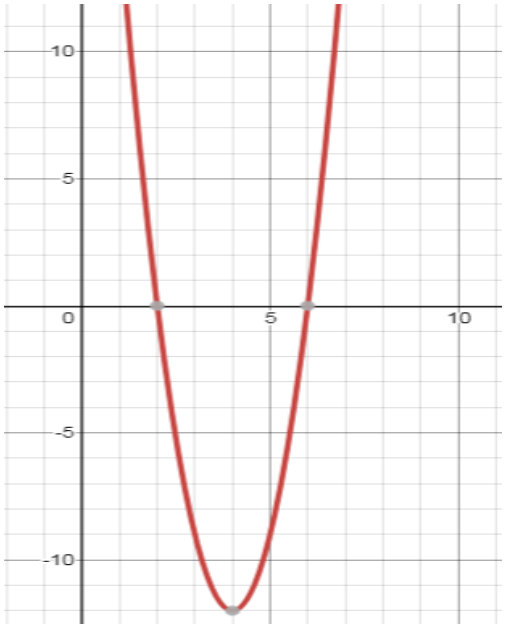
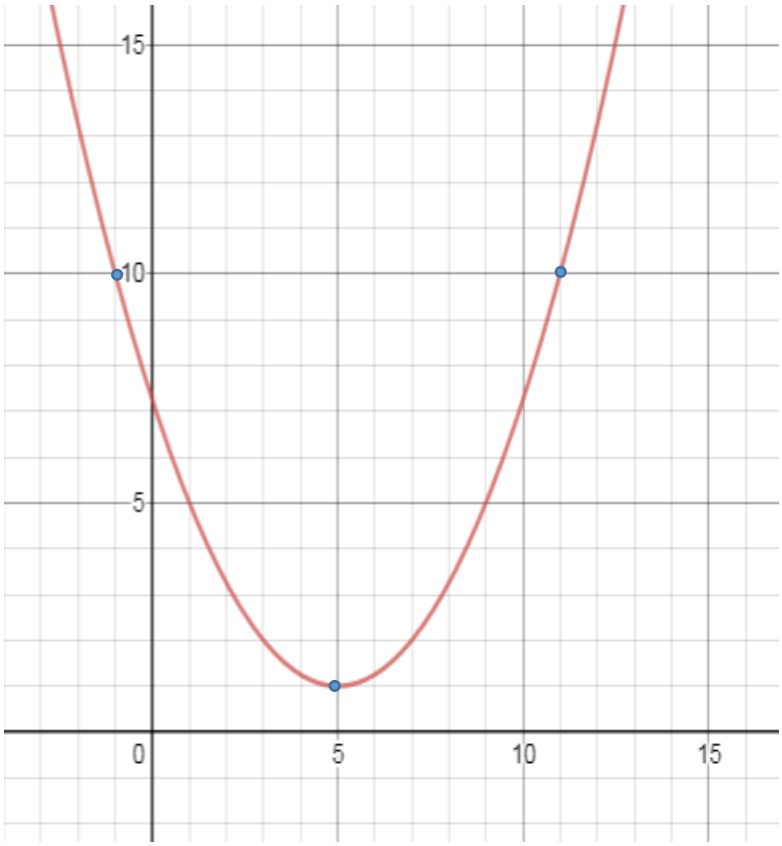
ALGEBRA RH **HW**

Writing Equations and Vertex Form

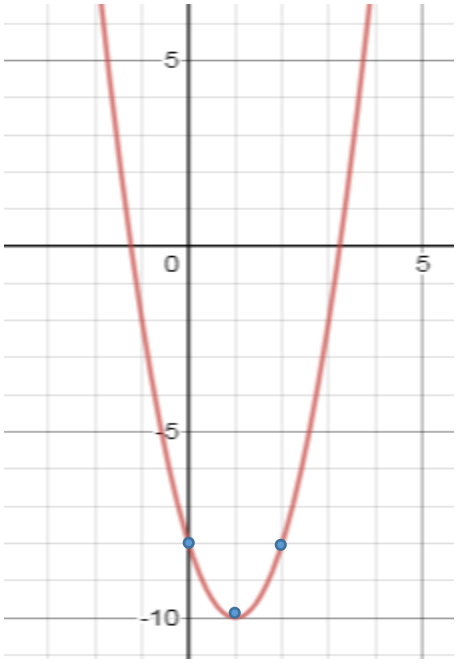
1. Write the equation of the parabola below is ***factored form.***



2. Write the equation of the parabola below is ***vertex form.***



3. Write the equation of the parabola below in ***standard form.***



4. For each quadratic equation below,

I) Write the equation in vertex form

II) Identify the vertex

a. $y = x^2 - 10x + 3$

b. $y = x^2 + 2x - 5$

c. $y = x^2 - 7x + 15$

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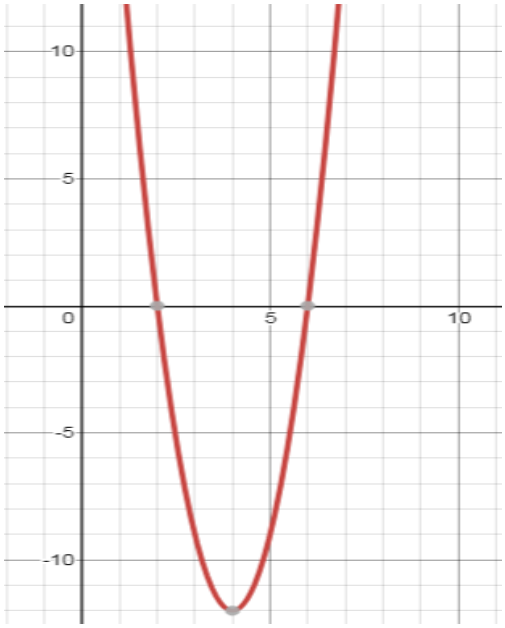
Writing Equations and Vertex Form

1. Write the equation of the parabola below is ***factored form.***



$$r_1 = 2$$

$$r_2 = 6$$

$$y = a(x-2)(x-6)$$

Plug in point $(4, -12)$

$$-12 = a(4-2)(4-6)$$

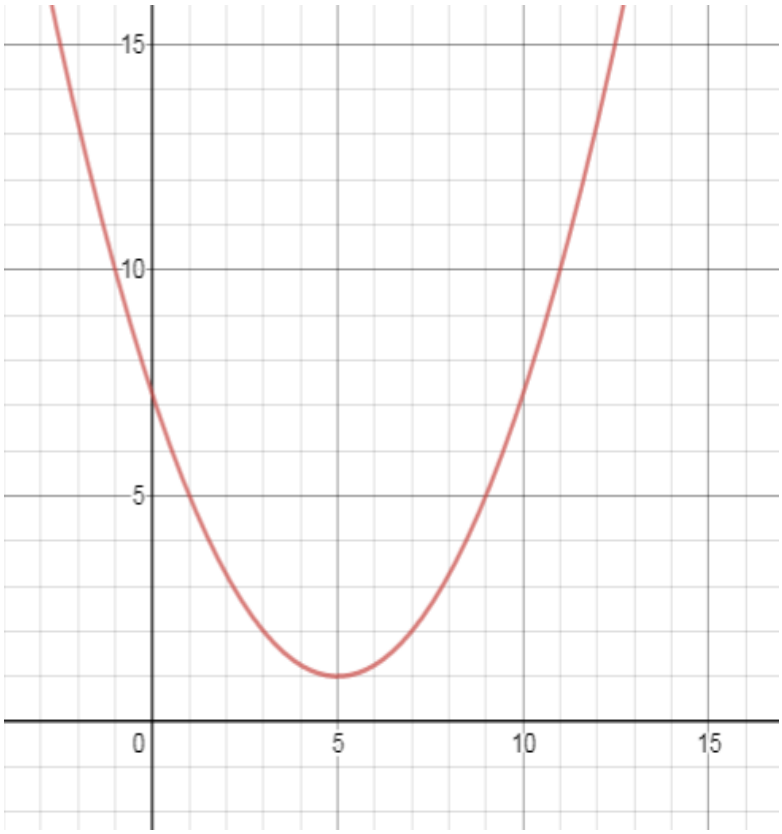
$$-12 = a(2)(-2)$$

$$-12 = -4a$$

$$a = 3$$

$$y = 3(x-2)(x-6)$$

2. Write the equation of the parabola below is ***vertex form.***



Vertex: $(5, 1)$

$$y = a(x-5)^2 + 1$$

Plug in point $(-1, 10)$

$$10 = a(-1-5)^2 + 1$$

$$10 = a(-6)^2 + 1$$

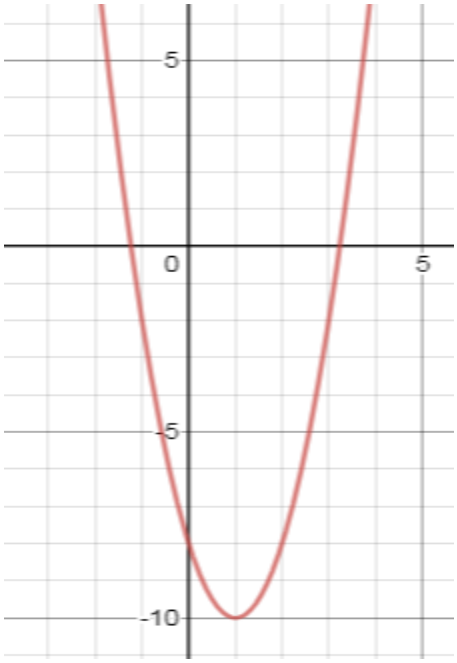
$$10 = 36a + 1$$

$$9 = 36a$$

$$a = \frac{1}{4}$$

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

3. Write the equation of the parabola below in ***standard form.***



Vertex: $(1, -10)$

$$y = a(x-1)^2 - 10$$

Plug in point $(2, -8)$

$$-8 = a(2-1)^2 - 10$$

$$-8 = a(1)^2 - 10$$

$$-8 = a - 10$$

$$a = 2$$

$$y = 2(x-1)^2 - 10$$

$$y = 2(x^2 - 2x + 1) - 10$$

$$y = 2x^2 - 4x + 2 - 10$$

$$y = 2x^2 - 4x - 8$$

4. For each quadratic equation below,

I) Write the equation in vertex form

II) Identify the vertex

a. $y = x^2 - 10x + 3$

$$y = x^2 - 10x + 25 + 3 - 25$$

$$y = (x-5)^2 - 22$$

Vertex: $(5, -22)$

b. $y = x^2 + 2x - 5$

$$y = x^2 + 2x + 1 - 5 - 1$$

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

Vertex: $(-1, -6)$

c. $y = x^2 - 7x + 15$

$$y = x^2 - 7x + \frac{49}{4} + 15 - \frac{49}{4}$$

$$y = \left(x - \frac{7}{2}\right)^2 + \frac{11}{4}$$

Vertex: $\left(\frac{7}{2}, \frac{11}{4}\right)$