

Warmup:

1. Given the following vertex form equation of a quadratic function, identify the vertex of the parabola.

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

2. Given the following standard form equation of a quadratic function,

$$y = x^2 - 8x - 9$$

it can be factored and written in standard form as follows.

$$y = (x - 9)(x + 1)$$

Use the roots and symmetry to find the vertex and rewrite the equation in vertex form.

3. Given the following standard form equation of a quadratic function, complete the square and rewrite in vertex form.

$$y = 3x^2 + 12x - 1$$

1. Given the following vertex form equation of a quadratic function, identify the vertex of the parabola.

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

$$a = -2$$

opp. same

$$h = -5$$

$$k = -2$$

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

Vertex: (h, k)

$\therefore (-5, -2)$

X	Y
-7	#
-6	#
-5	-2
-4	#
-3	#

2. Given the following standard form equation of a quadratic function,

$$y = 1x^2 - 8x - 9$$

$(4)^2 - 8(4) - 9$

it can be factored and written in standard form as follows.

$$y = (x - 9)(x + 1)$$

$$(4-9)(4+1)$$

$$-5 \cdot 5$$

Use the roots and symmetry to find the vertex and rewrite the equation in vertex form.

$$\text{Vertex: } (4, -25)$$

$$\begin{array}{l} 0 = x - 9 \\ x = 9 \end{array} \quad \left\{ \quad \begin{array}{l} 0 = x + 1 \\ x = -1 \end{array} \right.$$

middle

$$x = \frac{9 + -1}{2} = 4$$

$$y = 1 \cdot (x - 4)^2 - 25$$

3. Given the following standard form equation of a quadratic function,
complete the square and rewrite in vertex form.

$$y = 3x^2 + 12x - 1$$

+1
+1

$$y + 1 = 3x^2 + 12x$$

$$y + 1 = 3(x^2 + 4x + \underline{4})$$

$$\frac{4}{2} = \underline{2}$$

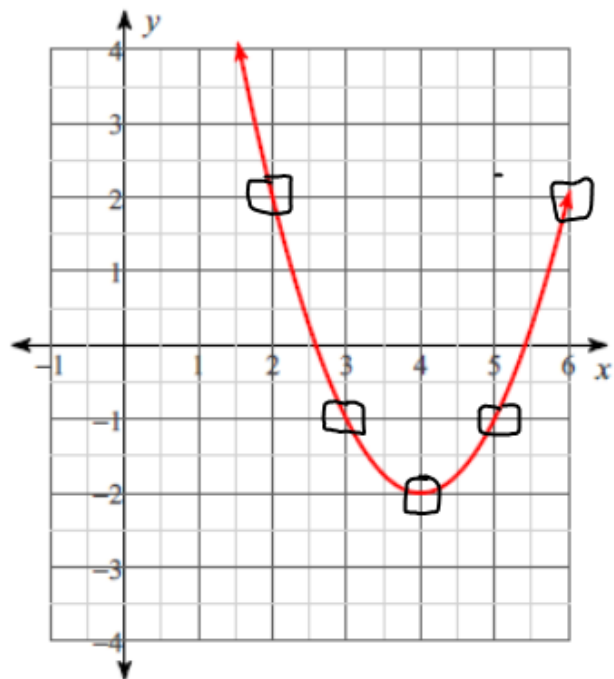
$$(\underline{2})^2 = 4$$

$$y + 13 = 3(x + 2)^2$$

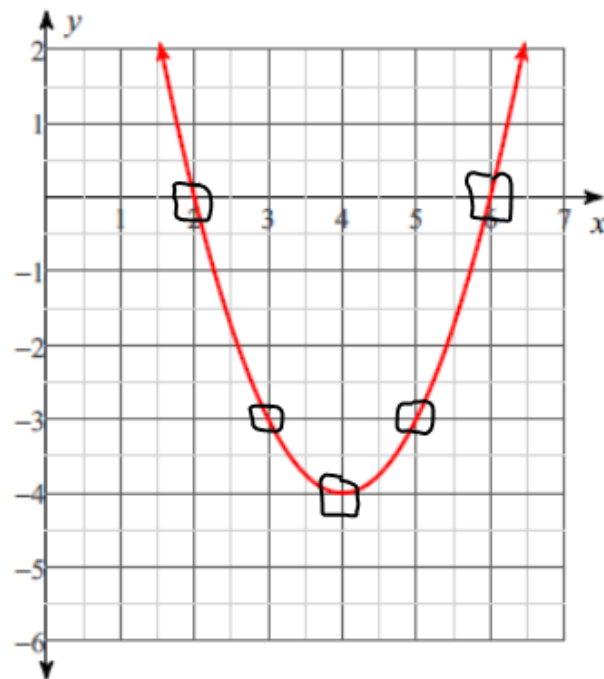
$$y = \underline{3}(x + \underline{2})^2 - \underline{13}$$

vertex
 $(\underline{-2}, \underline{-13})$

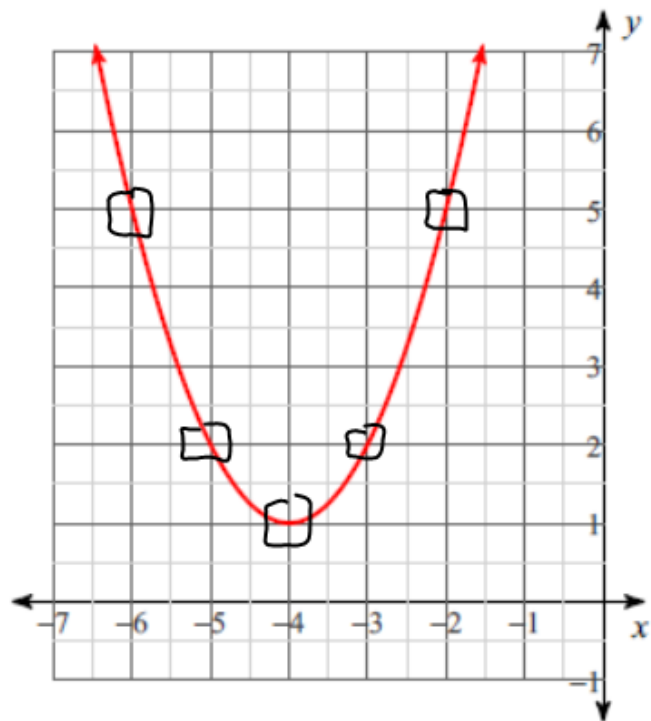
1) $y = x^2 - 8x + 14$



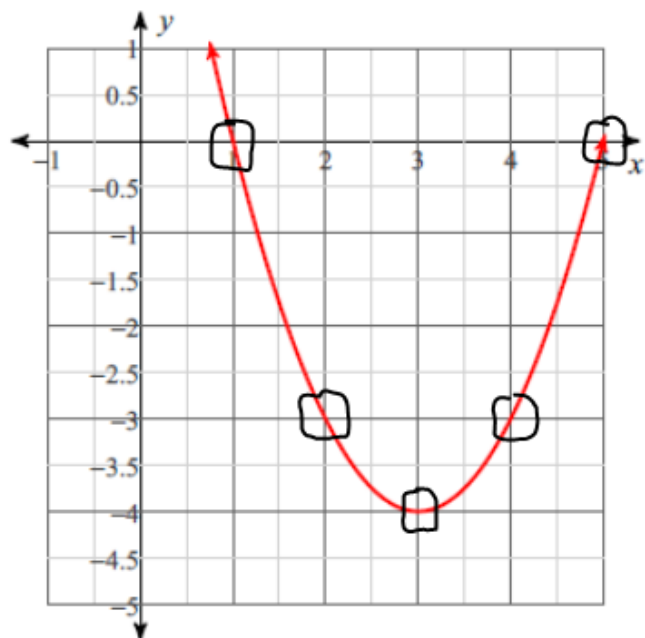
2) $y = x^2 - 8x + 12$



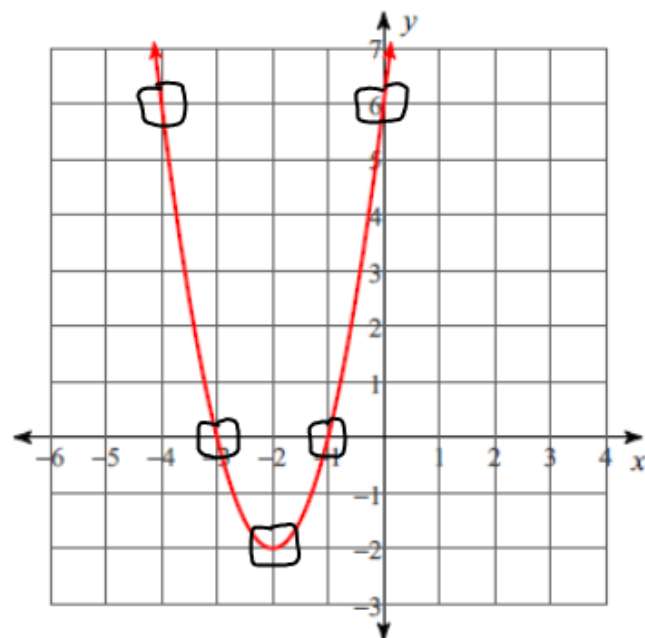
3) $y = x^2 + 8x + 17$



4) $y = x^2 - 6x + 5$

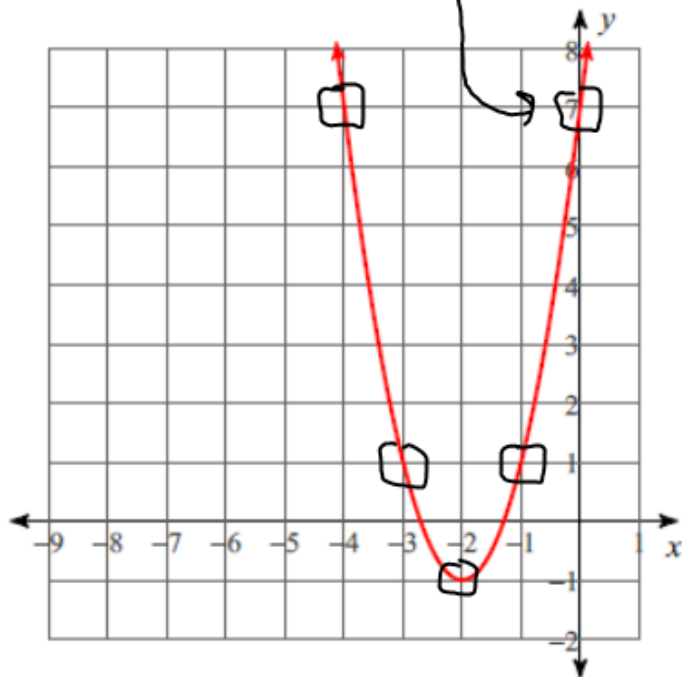


5) $y = 2x^2 + 8x + 6$



$$\frac{5x^2 + 3x - 4}{x - 4}$$

6) $y = 2x^2 + 8x + 7$ y -int



To Graph a Quadratic in Factored Form:

1) Use the zero product property to find the roots.

- Set each factor equal to 0 and solve for x.

2) Use the roots and symmetry to find the vertex.

- Add the roots and divide by 2 to get the x coordinate of the vertex.

- Plug the x into the equation to find the y coordinate.

3) Make a table to find two other points to graph.

$$y = (x - 9)(x + 1)$$

$$(1 - 9)(1 + 1) = -8 \cdot 2$$

$$(7 - 9)(7 + 1) = -2 \cdot 8$$

$$0 = x - 9$$

$$0 = x + 1$$

$$x = 9$$

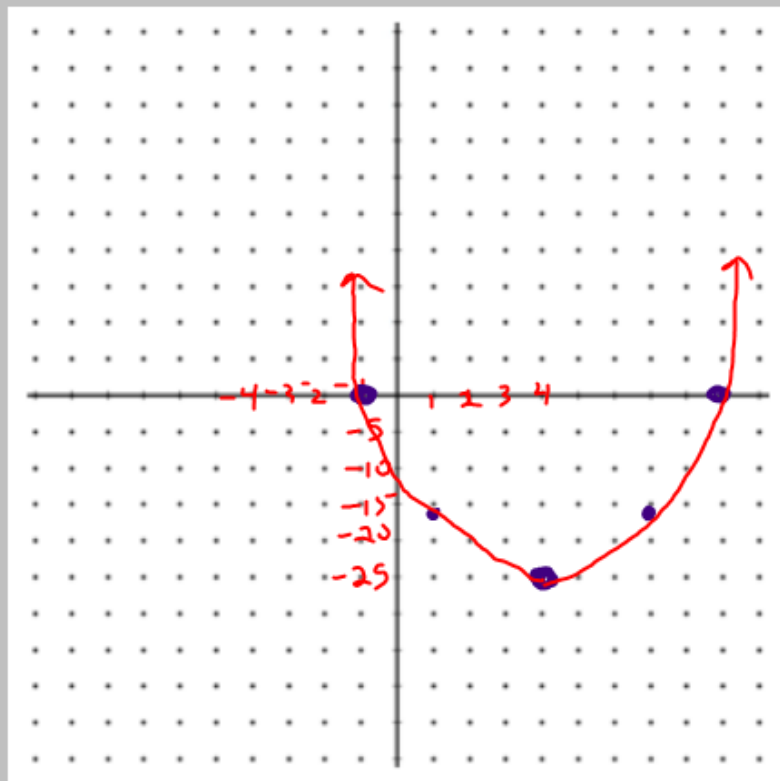
$$x = -1$$

$$\frac{9 + (-1)}{2} = \frac{8}{2} = 4$$

$$y = (4 - 9)(4 + 1)$$

$$y = -5 \cdot 5$$

$$y = -25$$



x	y
-1	0
1	-16
4	-25
7	-16
9	0

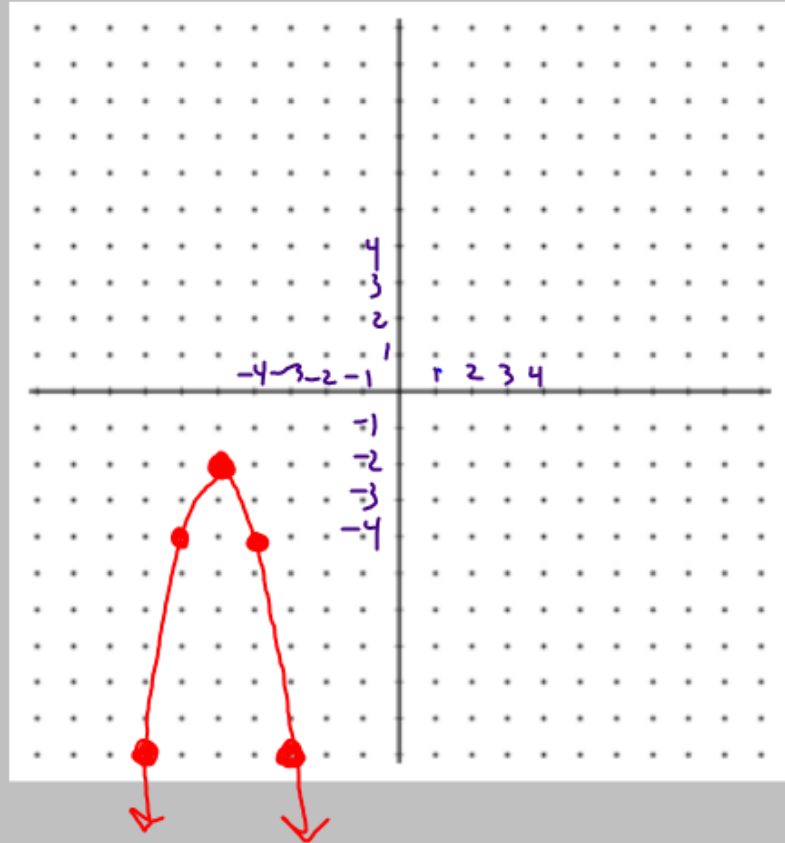
To Graph a Quadratic in Vertex Form:

- 1) Use vertex form to find the vertex.
- 2) Make a table of values to find 4 other points on the parabola.

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

vertex: $(-5, -2)$

x	y
-7	-10
-6	-4
-5	-2
-4	-4
-3	-10



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

$$0 = x - 2$$

$$0 = x + 6$$

$$x = 2$$

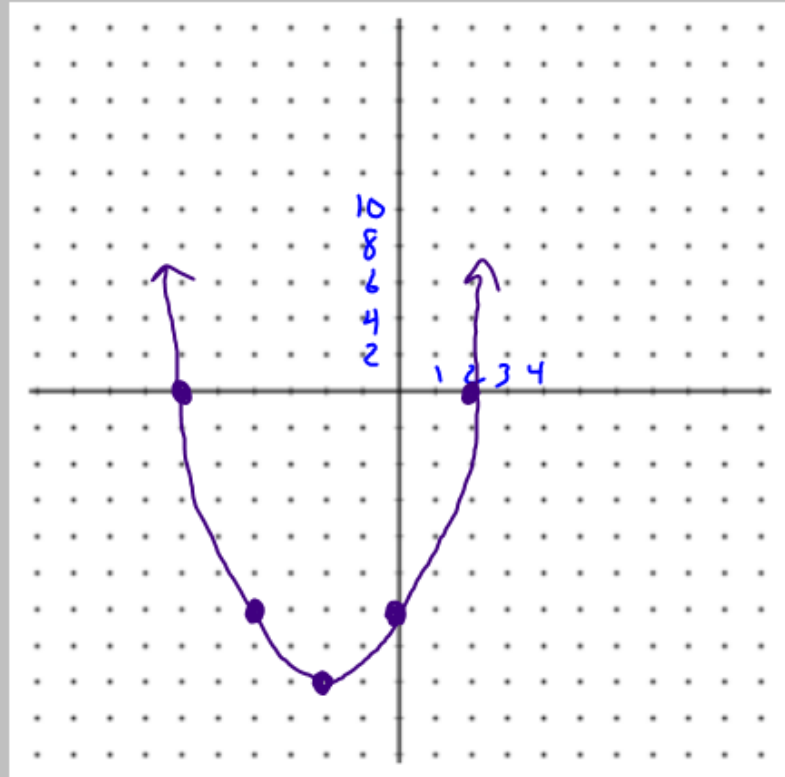
$$x = -6$$

$$\frac{2 + -6}{2} = \frac{-4}{2} = (-2, -16)$$

$$y = (-2 - 2)(-2 + 6)$$

$$-4 \cdot 4$$

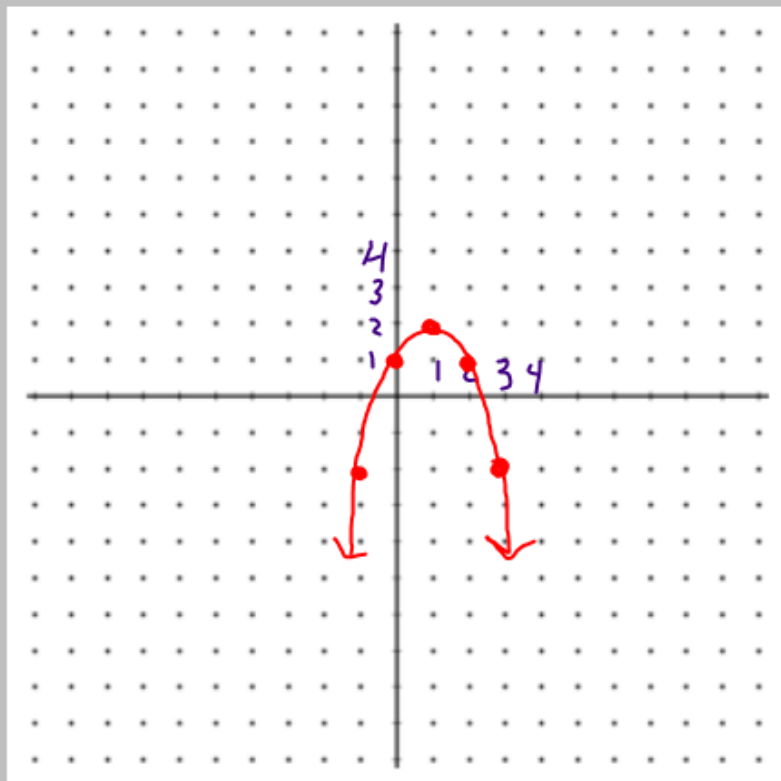
x	y
-6	0
-4	-12
-2	-16
0	-12
2	0



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

vertex: $(1, 2)$

x	y
-1	-2
0	1
1	2
2	1
3	-2



$$y = x^2 + 8x + 7$$

$$\frac{-8}{2(1)} = \frac{-8}{2} = (-4, \quad)$$

$$y = (-4)^2 + 8(-4) + 7$$

$$16 - 32 + 7$$

$$-16 + 7$$

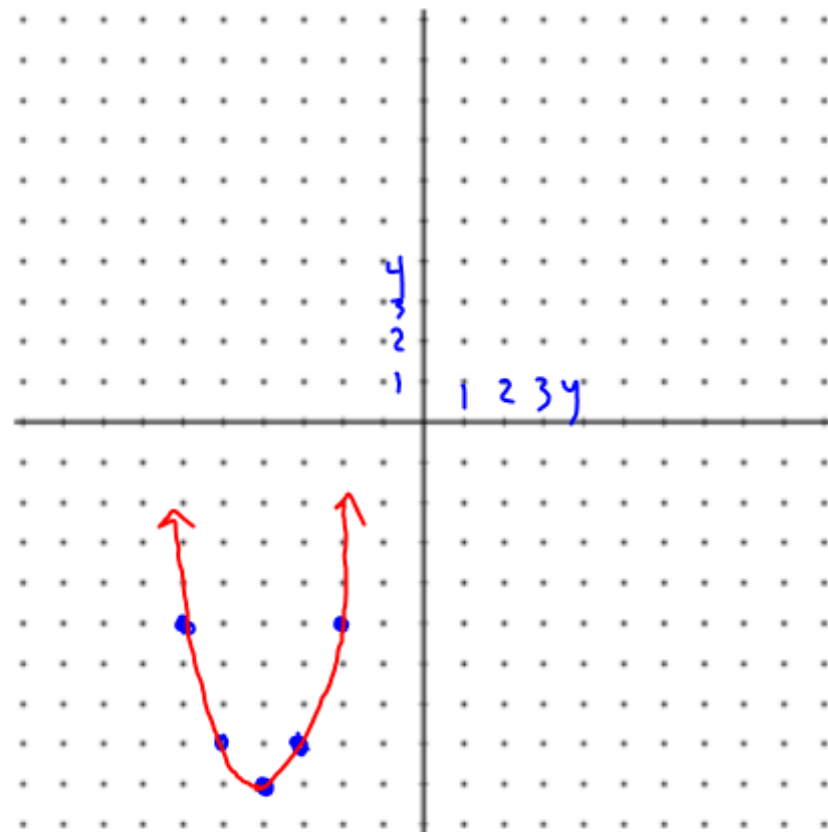
$$-9$$

x	y
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-6	-5
-5	-8

-4	-9
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-3	-8
-2	-5



HW #9:

Graphing Quadratic Equations