Grab a Bell Ringer & Hw Tracker - Week 7

Monday 10/8

What are the solutions of each equation? Use a graph of the related function.

1. $x^2 + 4 = 8$

$-4 \quad -4$

$\sqrt{x^2} = \sqrt{4}$

$x = \pm 2$

2. $x^2 + 16 = 0$

$-16 \quad -16$

$\sqrt{x^2} = \sqrt{-16}$

NO SOL.

3. $x^2 - 49 = 0$

$\sqrt{x^2} = \sqrt{49}$

$x = \pm 7$

4. What are the solutions of $6x^2 - 216 = 0$?

$+216 \quad +216$

$\frac{6x^2}{6} = \frac{216}{6}$

$\sqrt{x^2} = \sqrt{36}$

$x = \pm 6$

due tomorrow: Blue Transformations ws

Name_____ Hour_____ Ch 3 Translations of Quadratic Functions

For each function below, **(A)** identify the parent function, then **(B)** Describe in words the transformations made to the parent function.

1. $f(x)=x^2-3$

2. $f(x)=(x+2)^2$

3. $f(x)=x^2+5$

4. $f(x)=(-x+4)^2$

5. $f(x)=-6x^2$

6. $f(x)=\frac{1}{4}x^2-3$

7. $f(x)=\frac{2}{5}x^2-2$

8. $f(x)=3x^2+1$

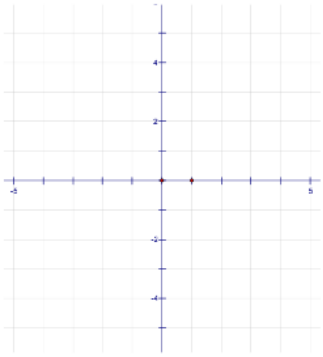
9. $f(x)=-(x+3)^2-5$

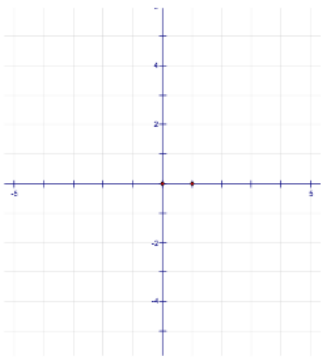
Sketch a graph of the function with the indicated transformations. (No Calculator)

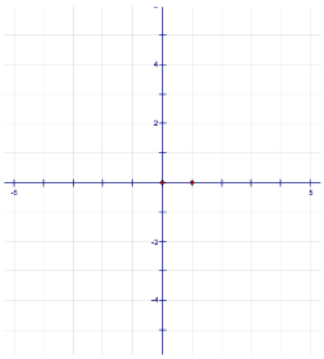
10. $f(x)=3(-x-5)^2+1$

11. $f(x)=\frac{1}{2}(x-4)^2+3$

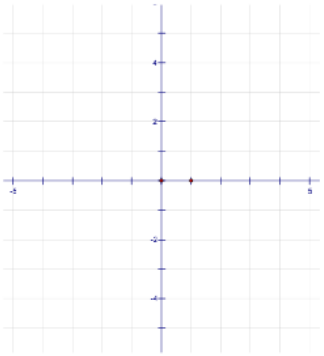
12. $f(x)=-\frac{1}{3}(-x+2)^2-2$



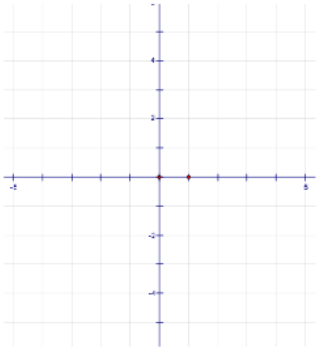




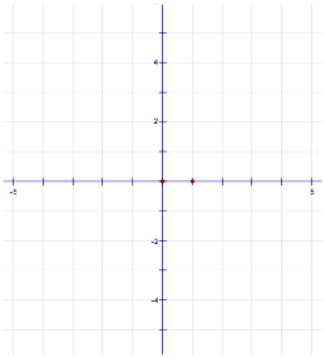
13. $f(x)=2(-x+1)^2-2$



14. $f(x)=-(x+4)^2$



15. $f(x)=-\frac{1}{2}(x-2)^2+1$



Write the function for $f(x)=x^2$ with the indicated transformations.

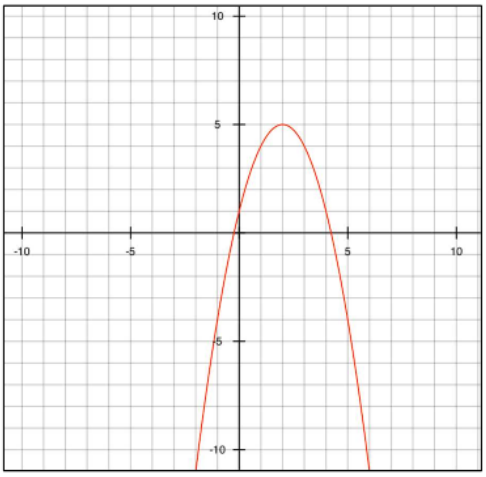
16. Vertical stretch by a factor of 3, horizontal shift left 5

17. Moved 4 units right and 5 units down.

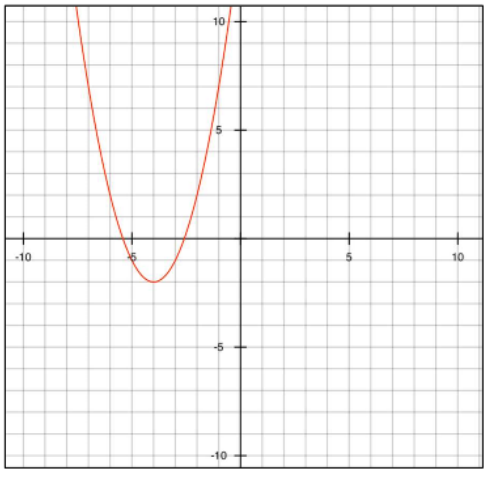
18. moved 6 units left and 2 units up.

Use the graphs below to identify each function. Write the function that corresponds to each graph.

19. _____



20. _____



Describe the transformation done to the parent function $f(x) = x^2$

$f(x) = x^2 + 5$

up 5

(0,5)

$f(x) = (x - 2)^2 + 7$

right 2

up 7

(2,7)

$f(x) = (x - 11)^2 + 0$

right 11

(11,0)

$f(x) = -\frac{1}{2}(x + 2)^2 - 2$

left 2 (-2,-2)

down 2

compression

flip over x-axis

Equation of a parabola in Vertex Form:

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

vertex: (h, k)

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

Identify the vertex (h, k) of each function

$f(x) = x^2 + 5$

$y = 1(x - 0)^2 + 5$

$(0, 5)$

$f(x) = (x - 11)^2 + 0$

$x - h$

$(11, 0)$

$f(x) = (x - 2)^2 + 7$

$x - h \quad + k$

$(2, 7)$

$f(x) = -\frac{1}{2}(x + 2)^2 - 2$

$x - h$

$x - (-2)$

$(-2, -2)$

$y = 3(x-5)^2+6$

$(5,6)$

$y = x^2+7$

$(0,7)$

$y = -\frac{1}{2}(x+7)^2-8$

$(-7,-8)$

$y = (x+5)^2$

$(-5,0)$

I can:

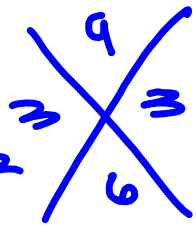
Change an equation from standard form to vertex form

Identify the vertex, axis of symmetry and y-intercept

Factor the trinomial

$x^2 + 6x + 9$

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



$\frac{6}{2} = 3^2$

What kind of trinomial is this??

How does "b" relate to "c"?

Find the value of "c" that makes the expression a perfect square trinomial

$x^2 + 8x + c$ → $c = 16$, $(x+4)(x+4)$, $(x+4)^2$

$x^2 + 10x + 25$ → $c = 25$, $\frac{10}{2} = 5$, $(x+5)^2$

$x^2 - 2x + c$ → $c = 1$, $(x-1)^2$

$x^2 - 16x + c$ → $c = 64$, $(x-8)^2$

Change from standard form to vertex form.
Identify the vertex and graph.

$y = x^2 + 6x - 16$

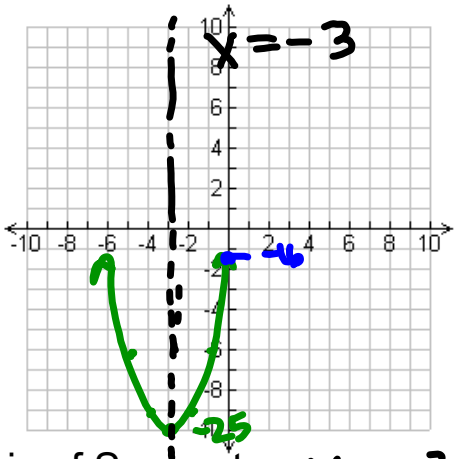
$y = 0 + 0 - 16$

$y = x^2 + 6x + 9 - 16 - 9$

$y = (x + 3)^2 - 25$ ($x - (-3)$)

$(-3, -25)$

AOS



Axis of Symmetry: $x = -3$

Y-intercept? $(0, -16)$

Change from standard form to vertex form.
Identify the vertex and graph.

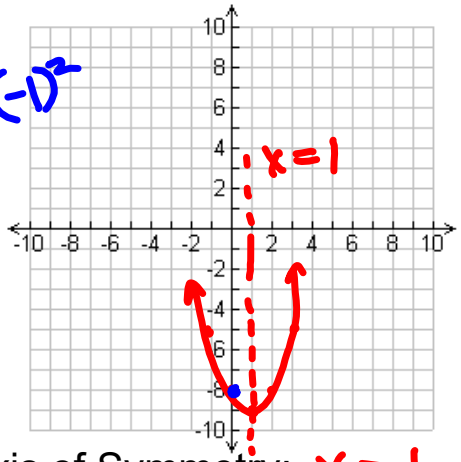
$y = x^2 - 2x - 8$

$c = \left(\frac{b}{2}\right)^2 \quad \left(\frac{-2}{2}\right)^2 = (-1)^2$

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

$y = (x - 1)^2 - 9$

$(1, -9)$



Axis of Symmetry: $x = 1$

Y-intercept? $(0, -8)$

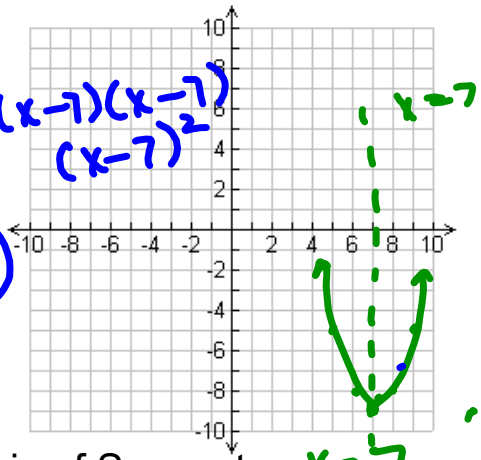
Change from standard form to vertex form.
Identify the vertex and graph.

$y = x^2 - 14x + 40$

$y = x^2 - 14x + 49 + 40 - 49$

$y = (x-7)^2 - 9$

$(7, -9)$



49, -7, -7, -14

$(x-7)(x-7)$

$(x-7)^2$

$x=7$

Axis of Symmetry: $x=7$

Y-intercept: $(0, 40)$

Change from standard form to vertex form.
Identify the vertex and graph.

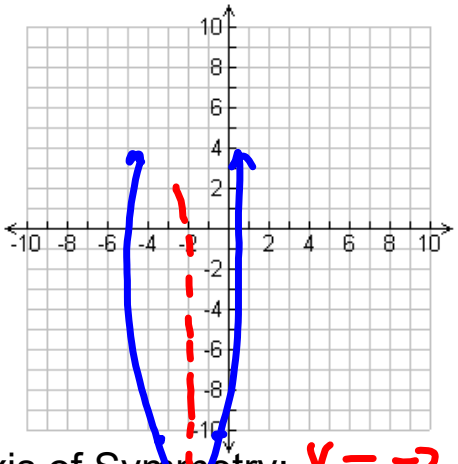
$$y = 5x^2 + 20x - 60$$

$y = 5(x^2 + 4x - 12)$

$y = 5(x^2 + 4x + 4 - 12 - 4)$

$y = 5(x+2)^2 - 16$

$(-2, -16)$

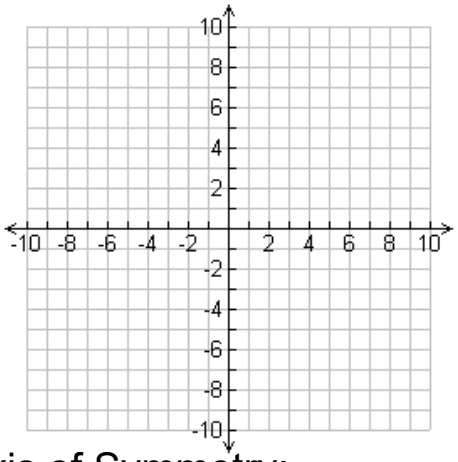


Axis of Symmetry: $x = -2$

Y-intercept? -12

Change from standard form to vertex form.
Identify the vertex and graph.

$$y = -x^2 - 8x + 5$$



Axis of Symmetry:
Y-intercept?

Vertex Form Worksheet A

Name:_____Hr:_____

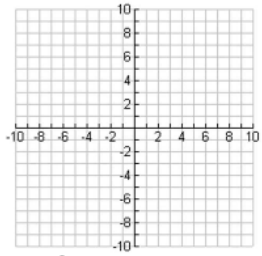
Vertex form: $y = a(x - h)^2 + k$

Change the equation from standard form to vertex form. Identify the vertex and axis of symmetry.

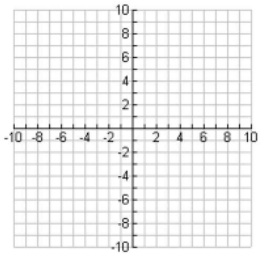
1. $y = x^2 + 4x - 12$
2. $y = x^2 - 6x + 21$
3. $y = x^2 - 8x + 4$
4. $y = x^2 + 3x - 5$
5. $y = 2x^2 + 4x - 12$
6. $y = -x^2 - 3x + 18$

Sketch the graph

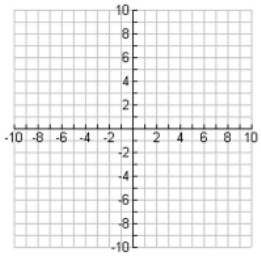
7. $y = (x-6)^2 + 3$



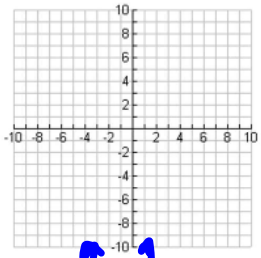
8. $y = x^2 - 2x - 5$



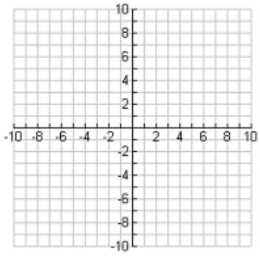
9. $y = x^2 + 4x$



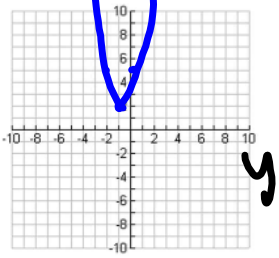
10. $y = 2(x+1)^2 - 4$



11. $f(x) = -3(x+2)^2 + 5$



12. $y = 3x^2 + 6x + 9$



$3(1x^2+2x+3)$

$x^2+2x+1-1+3$

$y=3(x+1)^2+2$

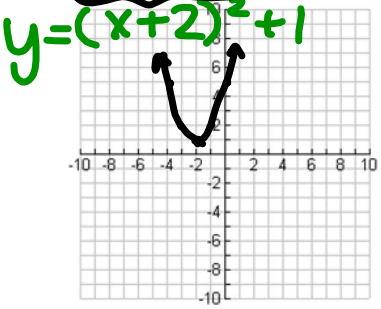
$(-1,2)$

Given the quadratic equations in standard form, find the following and graph:

13. $y = x^2 + 4x + 5$

x^2+4x $+4$ $+5$ -4

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



A) Vertex Form $y=(x+2)^2+1$

B) Vertex $(-2,1)$

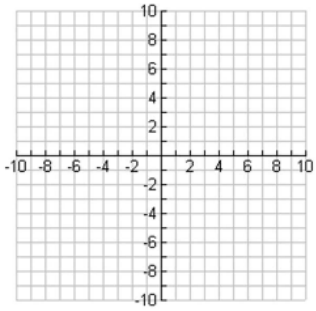
C) Axis of Symmetry $x=-2$

D) Max/Min Min

E) y-intercept 5

(plug in 0 for x & solve for y)

14. $y = x^2 - 8x + 7$



A) Vertex Form _____

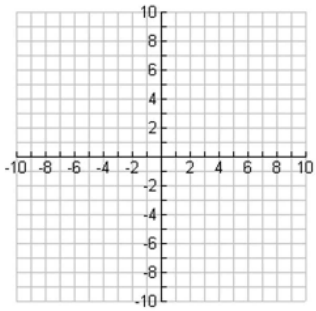
B) Vertex _____

C) Axis of Symmetry _____

D) Max/Min _____

E) y-intercept _____

15. $y = -2x^2 + 6x + 8$



A) Vertex Form _____

B) Vertex _____

C) Axis of Symmetry _____

D) Max/Min _____

E) y-intercept _____