Bell Ringer

Wednesday 10/16

Identify the vertex of the given parabolas.

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

$\frac{-b}{2a} = \frac{-(2)}{2(1)} = (-1, 0)$

2. $f(x) = -3(x + 2)^2 - 17$

$(-2, -17)$

3. $f(x) = x^2 - 25$

$(x+0)^2 - 25$

$(0, -25)$

4. $f(x) = 2(x - 1)^2 - 8$

$(1, -8)$

3.4 Day 1 online hw due today!
3.4 Day 2 online hw due Monday!

I can:

Change an equation from standard form to vertex form

Identify the vertex, axis of symmetry and y-intercept

Factor the trinomial

$x^2 + 6x + 9$

$(x+3)(x+3)$

$x^2 - 9$

What kind of trinomial is this??

How does "b" relate to "c"?

$x^2 + 3x + 3x + 9 \Rightarrow x^2 + 6x + 9$

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

$x^2 + 8x + c$ $\quad c = \left(\frac{b}{2}\right)^2$

4 16

$x^2 + 8x + 16$

$(x+4)(x+4) = (x+4)^2$

$x^2 + 10x + c$

$\frac{10}{2} = 5^2$ 25

$x^2 + 10x + 25$

$(x+5)^2$

$x^2 - 2x + c = 1$

-1

$x^2 - 2x + 1$

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

$x^2 - 16x + c = 64$

-8

$x^2 - 16x + 64$

$(x-8)^2$

Steps to Complete the Square:

(1) Put in standard form, then factor out the GCF

(2) Rewrite the equation with a space after bx and after c

(3) Divide the middle term (b) by 2, then square it

(4) Write the number from (3) in the spaces created from (2), positive in the first blank, negative in the second

(5) Put in Vertex Form

a. Factor the perfect square and combine left over constant terms

(6) Distribute the GCF back in

Change from standard form to vertex form. Identify the vertex, axis of symmetry, y-intercept and then graph.

Steps to Complete the Square:

(1) Put in standard form, then factor out the GCF

(2) Rewrite the equation with a space after bx and after c

(3) Divide the middle term (b) by 2, then square it

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(5) Put in Vertex Form

a. Factor the perfect square and combine left over constant terms

(6) Distribute the GCF back in

ax^2+bx+c

$y = x^2 + 6x - 16$ +9 −9

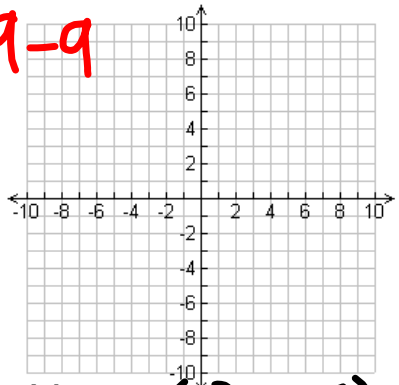
$y = x^2 + 6x \underline{+9} - 16 \underline{-9}$

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

$(x+3)(x+3) - 25$

$x^2 + 3x + 3x + 9 - 25$

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



Vertex: $(-3, -25)$

Axis of Symmetry: $x = -3$

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

Change from standard form to vertex form. Identify the vertex, axis of symmetry, y-intercept and then graph.

Steps to Complete the Square:

(1) Put in standard form, then factor out the GCF

(2) Rewrite the equation with a space after bx and after c

(3) Divide the middle term (b) by 2, then square it

(4) Write the number from (3) in the spaces created from (2), positive in the first blank, negative in the second

(5) Put in Vertex Form

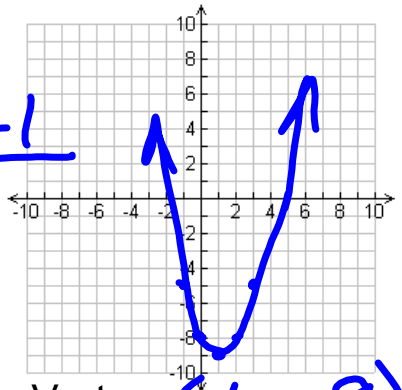
a. Factor the perfect square and combine left over constant terms

(6) Distribute the GCF back in

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

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

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



Vertex: $(1, -9)$

Axis of Symmetry: $x = 1$

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

Change from standard form to vertex form. Identify the vertex, axis of symmetry, y-intercept and then graph.

Steps to Complete the Square:

(1) Put in standard form, then factor out the GCF

(2) Rewrite the equation with a space after bx and after c

(3) Divide the middle term (b) by 2, then square it

(4) Write the number from (3) in the spaces created from (2), positive in the first blank, negative in the second

(5) Put in Vertex Form

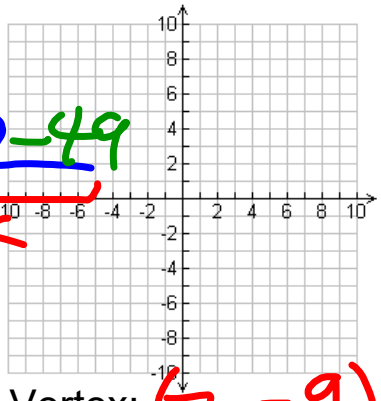
a. Factor the perfect square and combine left over constant terms

(6) Distribute the GCF back in

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

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

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



Vertex: $(7, -9)$

Axis of Symmetry: $x = 7$

Y-intercept? $(0, 40)$

Change from standard form to vertex form. Identify the vertex, axis of symmetry, y-intercept and then graph.

Steps to Complete the Square:

(1) Put in standard form, then factor out the GCF

(2) Rewrite the equation with a space after bx and after c

(3) Divide the middle term (b) by 2, then square it

(4) Write the number from (3) in the spaces created from (2), positive in the first blank, negative in the second

(5) Put in Vertex Form

a. Factor the perfect square and combine left over constant terms

(6) Distribute the GCF back in

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

$y = 5[x^2 + 4x - 12]$

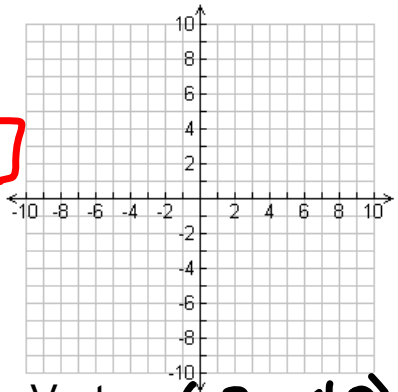
$5[x^2 + 4x + 4 - 12 - 4]$

$5[(x+2)^2 - 16]$

$y = 5(x+2)^2 - 80$

$(+)^2$

$(-)^2$



Vertex: $(-2, -80)$

Axis of Symmetry: $x = -2$

Y-intercept? $(0, -60)$

Change from standard form to vertex form. Identify the vertex, axis of symmetry, y-intercept and then graph.

Steps to Complete the Square:

(1) Put in standard form, then factor out the GCF

(2) Rewrite the equation with a space after bx and after c

(3) Divide the middle term (b) by 2, then square it

(4) Write the number from (3) in the spaces created from (2), positive in the first blank, negative in the second

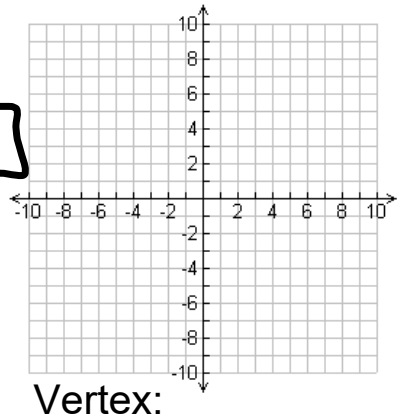
(5) Put in Vertex Form

a. Factor the perfect square and combine left over constant terms

(6) Distribute the GCF back in

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

$-1[x^2+8x-5]$



Vertex:

Axis of Symmetry:

Y-intercept?

due Tuesday :)

Vertex Form Using Completing the Square

Name:_____Hr:_____

Vertex form: $y = a(x-h)^2 + k$ $\quad c = \left(\frac{b}{2}\right)^2$

Find the value of 'c' that would make a perfect square trinomial. Then write the expression as a square of a binomial.

a) $x^2 + 4x + c$ b) $x^2 - 2x + c$ c) $x^2 + 18x + c$

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. $y = -x^2 - 3x + 18$

$y = -1[x^2+3x-18]$

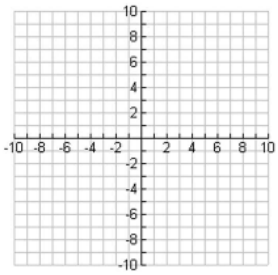
$y = -1[x^2+3x+2.25-18-2.25]$

$y = -1[(x+1.5)^2-20.25]$

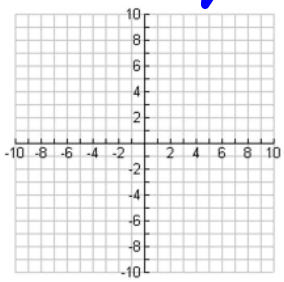
$y = -(x+1.5)^2+20.25$

Change the equation from standard form to vertex form and identify the vertex. Then sketch a graph

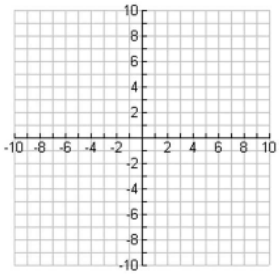
7. $y = x^2 + 16x + 71$



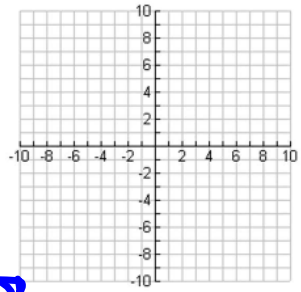
8. $y = x^2 - 2x - 5$



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



10. $y = -x^2 - 6x - 5$



11. $y = -2x^2 + 4x + 3$

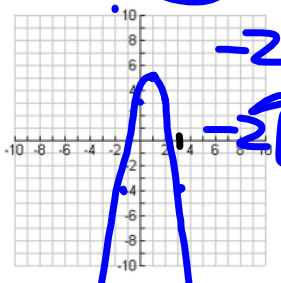
$-2[x^2-2x-1.5]$

$-2[x^2-2x+1-1.5-1]$

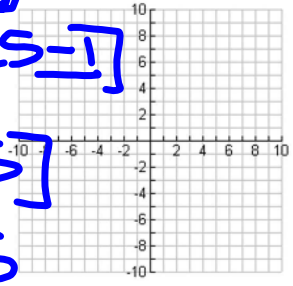
$-2[(x-1)^2-2.5]$

$-2(x-1)^2+5$

$(1,5)$

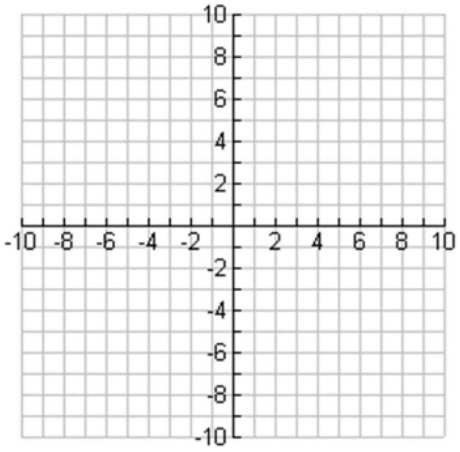


12. $y = 3x^2 + 6x + 9$



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

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



A) Vertex Form _____

B) Vertex _____

C) Axis of Symmetry _____

D) Max/Min _____

E) y-intercept _____

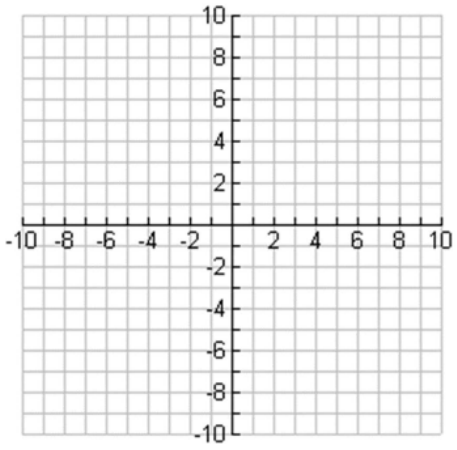
F) x-intercept(s): _____

G) Domain: _____

H) Range: _____

I) Find f(4): _____

14. $y = x^2 - 8x + 12$



A) Vertex Form _____

B) Vertex _____

C) Axis of Symmetry _____

D) Max/Min _____

E) y-intercept _____

F) x-intercept(s): _____

G) Domain: _____

H) Range: _____

I) Find f(3): _____