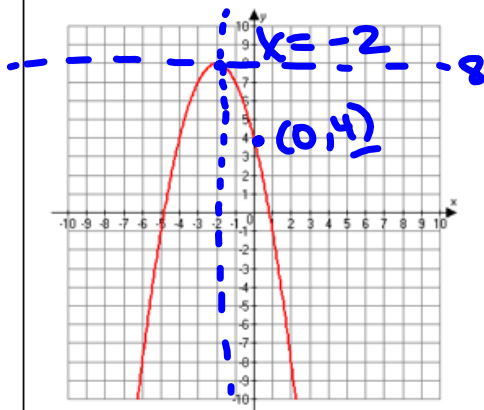


Bell Ringer

Thursday 10/11

For the following graph identify the following:



1. vertex: $(-2, 8)$
2. max or min: max
3. Axis of Symmetry: $x = -2$
4. Domain: $(-\infty, \infty)$
5. Range: $(-\infty, 8]$
6. Would the leading Coefficient be:
Positive or negative
7. The quadratic equation would have
a constant term of: 4

8. Order the quadratic equations from 1-3. Widest being 1, to narrowest being 3.

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

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

$f(x) = x^2 + 10$

3

1

2

Correct Vertex Form B ws

Vertex Form Worksheet B

Name: _____ Hr: _____

Axis of symmetry: $x = h = \frac{-b}{2a}$, $k = f(h)$ Vertex: (h, k) Vertex form: $y = a(x - h)^2 + k$

Use the formula $\left(-\frac{b}{2a}, \text{---}\right)$ to find the vertex and then write the equation in vertex form.

1. $y = x^2 - 6x + 1$

2. $y = -4x^2 + 16x - 11$

3. $y = x^2 - 8x + 18$

$a=1$ $b=-8$ $c=18$

$h = \frac{-(-8)}{2(1)} = \frac{8}{2} = 4$
 $k = f(4) = 4^2 - 8(4) + 18 = 16 - 32 + 18 = 2$
 $y = (x - 4)^2 + 2$

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

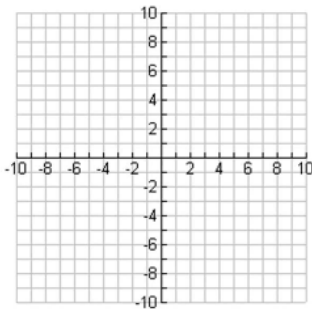
5. $y = 2x^2 - x + 1$

6. $f(x) = x^2 - 8x + 16$

$h = \frac{-(-1)}{2(2)} = \frac{1}{4}$ $k = f\left(\frac{1}{4}\right) = 2\left(\frac{1}{4}\right)^2 - \frac{1}{4} + 1 = \frac{1}{8} - \frac{2}{8} + \frac{8}{8} = \frac{7}{8}$
 $y = 2\left(x - \frac{1}{4}\right)^2 + \frac{7}{8}$

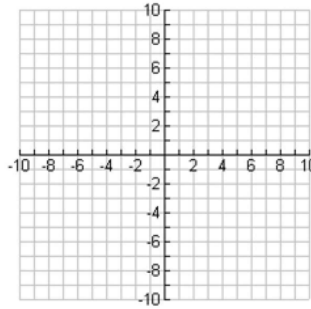
Find the following given the equations: (a) write the equation in vertex form, (b) identify the vertex, (c) identify the axis of symmetry, (d) state if the vertex is a max or a min, and (e) sketch a graph.

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



- a)
- b)
- c)
- d)
- e)

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



- a)
- b)
- c)
- d)
- e)

State if the equation is in vertex form or standard form or both. Then find the vertex for the equations below.

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

10. $y = x^2 - 25$

11. $y = -2x^2 + 20x - 35$

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

13. $y = 4x^2 + 24x$

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

Vertex Form Worksheet B

Name: key Hr: 10/10/18

Axis of symmetry: $h = x = \frac{-b}{2a}$, $k = f(h)$ Vertex: (h, k) Vertex form: $y = a(x-h)^2 + k$

Use the formula $(-\frac{b}{2a}, \text{---})$ to find the vertex and then write the equation in vertex form.

1. $y = x^2 - 6x + 1$

$y = (x-3)^2 - 8$
v: (3, -8)

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

$h = \frac{-2}{2(-1)} = 1$ $k = -(1)^2 + 2(1) + 5 = 6$

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

2. $y = -4x^2 + 16x - 11$

$y = -4(x-2)^2 + 5$
v: (2, 5)

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

$h = \frac{1}{2(2)} = \frac{1}{4}$

$k = 2(\frac{1}{4})^2 - \frac{1}{4} + 1 = .875$

or $y = 2(x - \frac{1}{4})^2 + .875$, v: $(\frac{1}{4}, .875)$

3. $y = x^2 - 8x + 18$

$h = \frac{8}{2(1)} = 4$ $k = (4)^2 - 8(4) + 18 = -2$

$y = (x-4)^2 - 2$ v: (4, -2)

6. $f(x) = x^2 - 8x + 16$

$h = \frac{8}{2(1)} = 4$ $k = (4)^2 - 8(4) + 16 = 0$

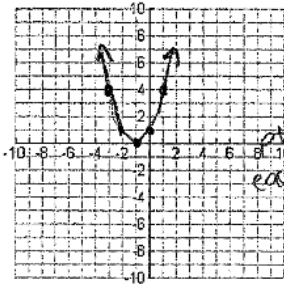
$y = (x-4)^2$, v: (4, 0)

Find the following given the equations: (a) write the equation in vertex form, (b) identify the vertex, (c) identify the axis of symmetry, (d) state if the vertex is a max or a min, and (e) sketch a graph.

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

$h = \frac{-2}{2(1)} = -1$

$k = (-1)^2 + 2(-1) + 1 = 0$

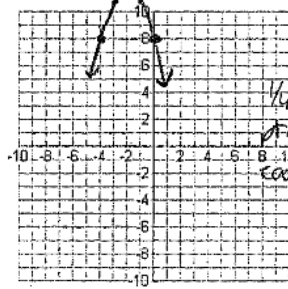


- a) $y = (x+1)^2$
- b) (-1, 0)
- c) $x = -1$
- d) min
- e) ✓

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

$h = \frac{4}{2(-1)} = -2$

$k = -(-2)^2 - 4(-2) + 8 = 12$



- a) $y = -(x+2)^2 + 12$
- b) v: (-2, 12)
- c) $x = -2$
- d) max
- e) ✓

State if the equation is in vertex form or standard form or both. Then find the vertex for the equations below.

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

Vertex form
v: (6, 3)

10. $-y = x^2 - 25$

both
v: (0, -25)

11. $y = -2x^2 + 20x - 35$

Standard
 $h = \frac{-20}{2(-2)} = 5$ $k = -2(5)^2 + 20(5) - 35 = 15$

v: (5, 15)

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

both
v: (0, -6)

13. $y = 4x^2 + 24x$

Standard
 $h = \frac{-24}{2(4)} = -3$
 $k = 4(-3)^2 + 24(-3) = -36$

v: (-3, -36)

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

vertex
(-2, -17)

Find Parts of a Parabola ws due tomorrow

Short Review...
WHITEBOARDS

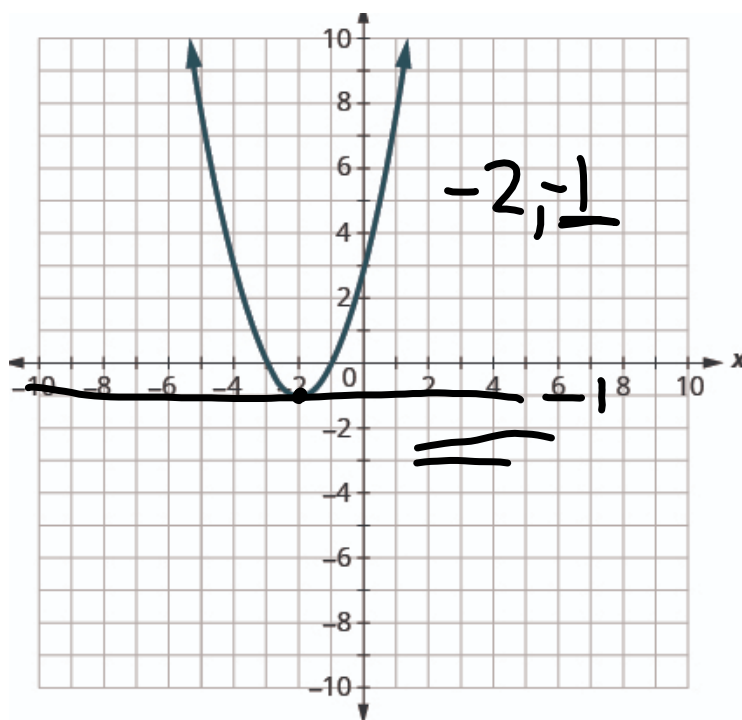
Vertex: $(-2, -1)$

max or min? min

Domain: $(-\infty, \infty)$

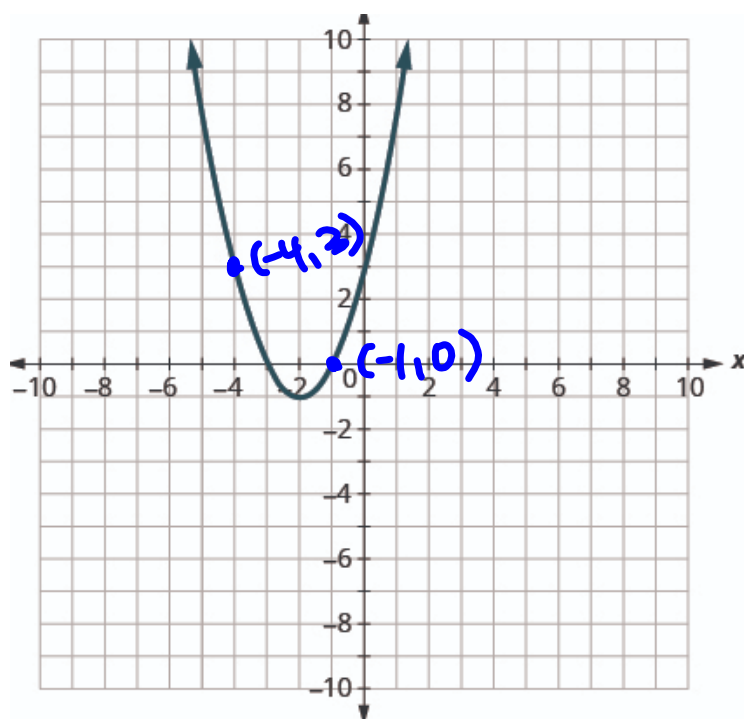
Range: $[-1, \infty)$

~~Domain~~



$$f(-4) = 3$$

$$f(-1) = 0$$

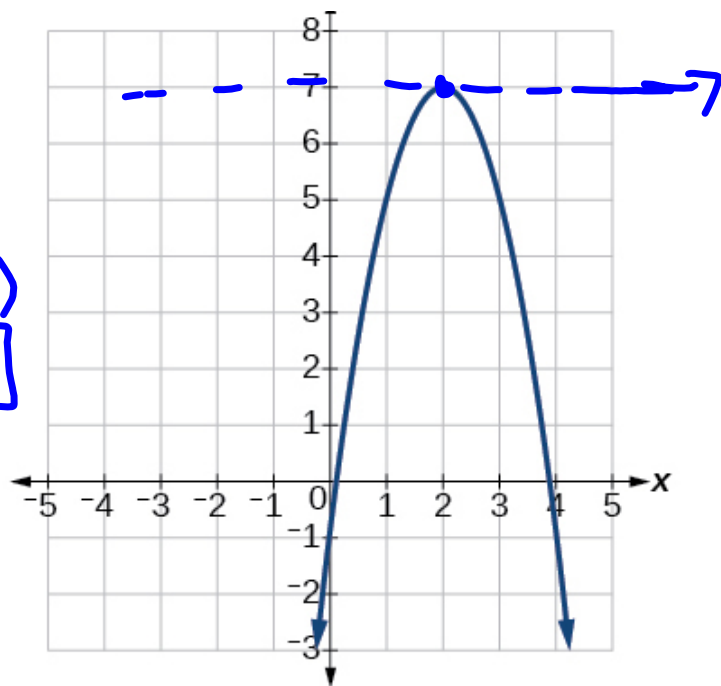


Vertex: $(2, 7)$

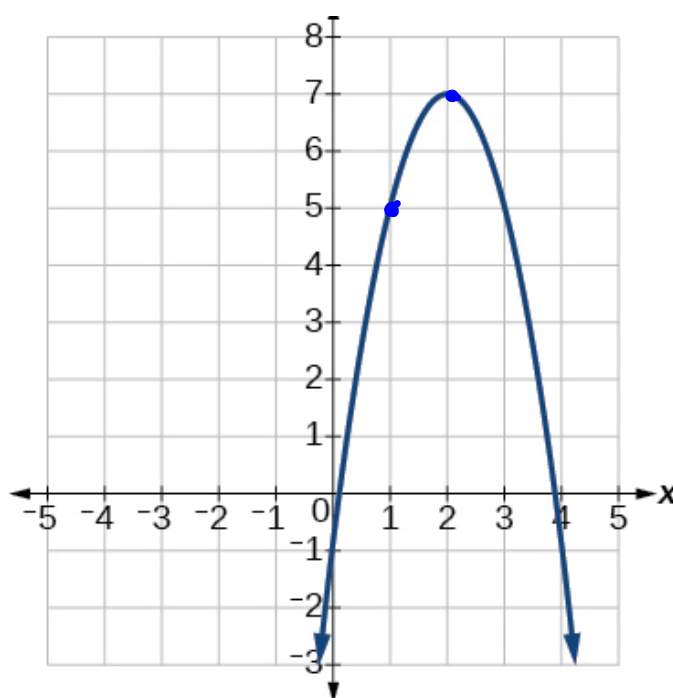
max or min? *max*

Domain: $(-\infty, \infty)$

Range: $(-\infty, 7]$



$f(1) = 5$
 $f(2) = 7$

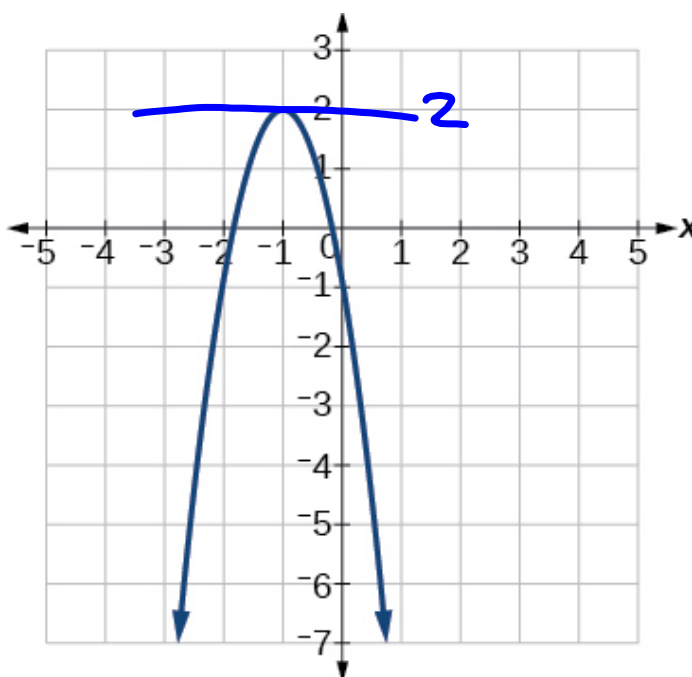


Vertex: $(-1, 2)$

max or min? max

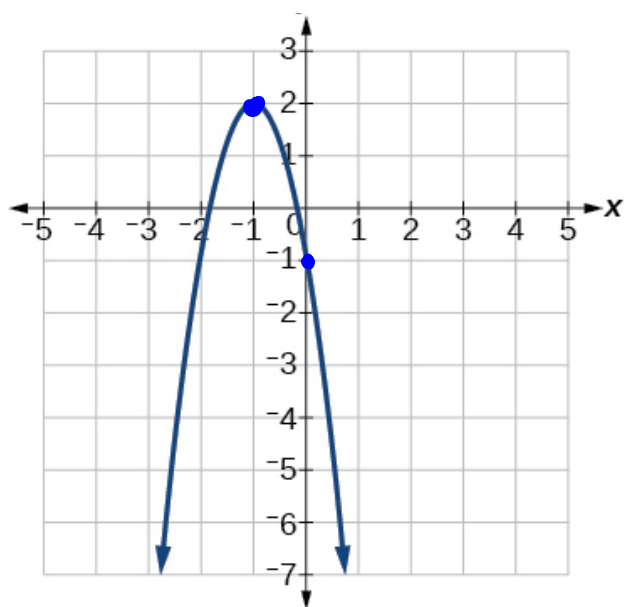
Domain: $(-\infty, \infty)$

Range: $(-\infty, 2]$



$$f(-1) = 2$$

$$f(0) = -1$$

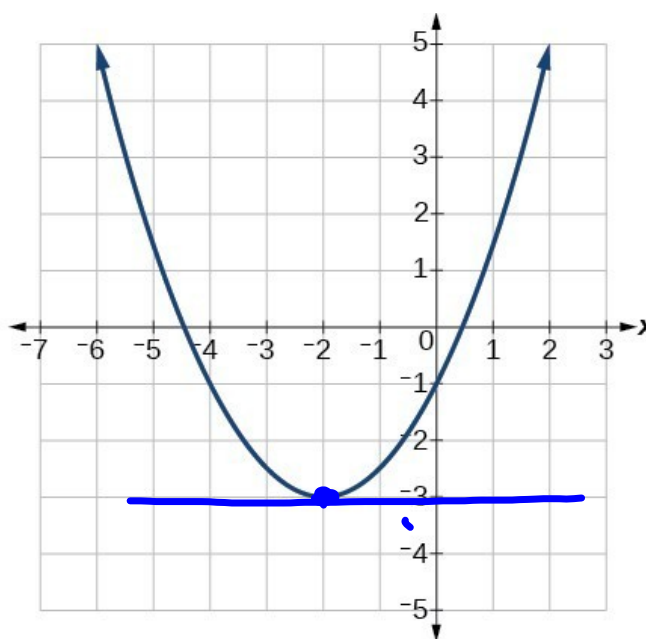


Vertex: $(-2, -3)$

max or min? min

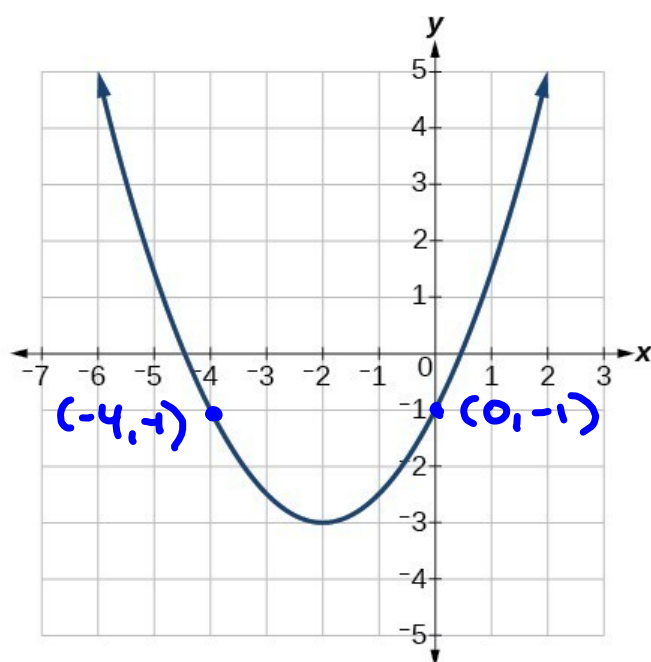
Domain: $(-\infty, \infty)$

Range: $[-3, \infty)$



$$f(-4) = -1$$

$$f(0) = -1$$

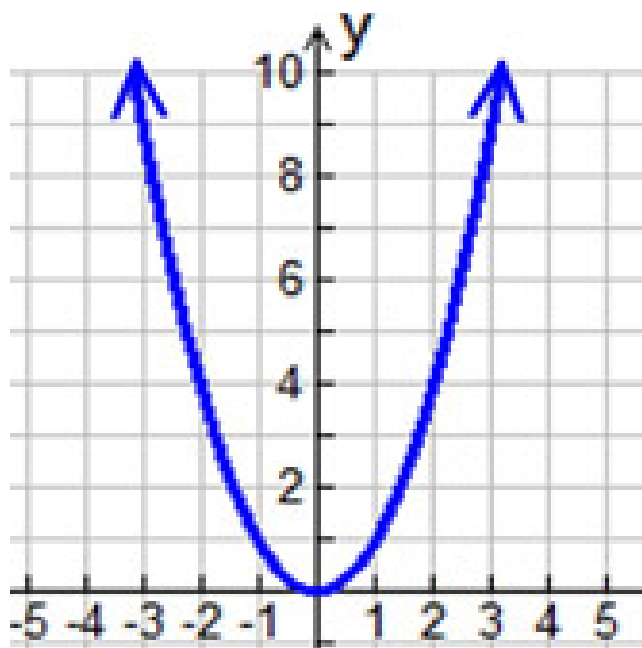


Vertex: $(0, 0)$

max or min? \min

Domain: $(-\infty, \infty)$

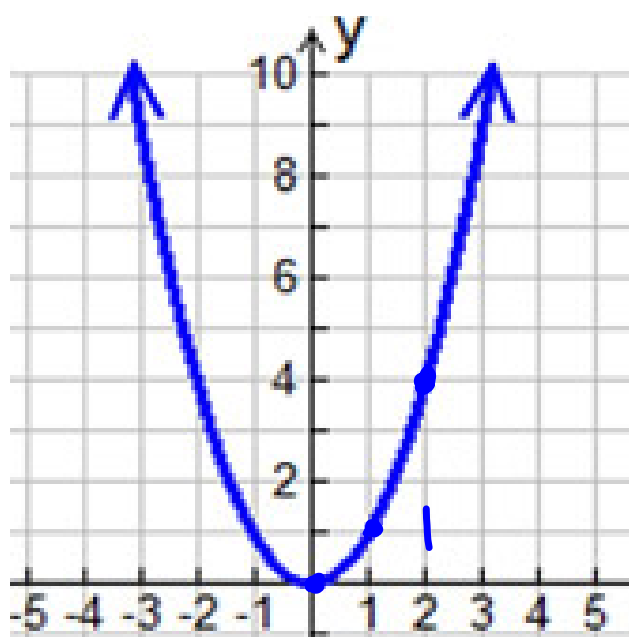
Range: $[0, \infty)$



$$f(0) = (0, 0)$$

$$f(1) = (1, 1)$$

$$f(2) = 4$$



Quadratics Unit- Three Ways to Represent Quadratic Functions Task

Name _____ Hr _____

As a class (notes)

1. Below we will write the general form for each "form" of a quadratic equation.

Standard Form:
 $y = ax^2 + bx + c$

Factored Form:
 $y = (x-p)(x-q)$

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

How to Find the Vertex in:

2. Standard Form:
 $\left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right)$

Factored Form:
 FOIL/BOX

Vertex Form:
 (h, k)

3. Find the vertex of each quadratic function:

A. $y = x^2 - 10x + 24$

$$\frac{-(-10)}{2(1)} = 5$$

$$(5, -1)$$

B. $y = (x-4)(x-6)$

$$x^2 - 10x + 24$$

$$(5, -1)$$

C. $y = (x-5)^2 - 1$

$x-4=0 \Rightarrow x=4$
 $x-6=0 \Rightarrow x=6$
 $(5, -1)$

4. Below, list key features of the graph that are easily obtained using each equivalent form.

Std. Equation A: y-intercept $(0, c)$ $y = ax^2 + bx + c$

Factor: Equation B: x-intercepts $x=p, x=q$

Vertex Equation C: vertex (h, k)

5. You should already have found that Equation A = Equation B, now show they are also equal to Equation C by writing Equation C in standard form.

Part 2:

6. Enter the following functions into your graphing calculator.

A. $p(x) = 2x^2 - 12x + 16$

B. $f(x) = 2(x-2)(x-4)$

C. $v(x) = 2(x-3)^2 - 2$

y-int $(0, 16)$

$x^2 - 4x - 2x + 8$
 $x = 2, 4$

$(3, -2)$

7. What do you notice about the graphs?

$2(x^2 - 6x + 8)$
 $2(x^2 - 12x + 16)$ $2(x-2)(x-3)^2$

Answer 8-10 using the equations (A, B, and C) from #6.

8. Find the y-intercept. Which equation helped you find the y-intercept?

$(0, 16)$ standard

$2(x^2 - 6x + 9) - 2$
 $-2x^2 - 12x + 18 - 2$
 $+16$

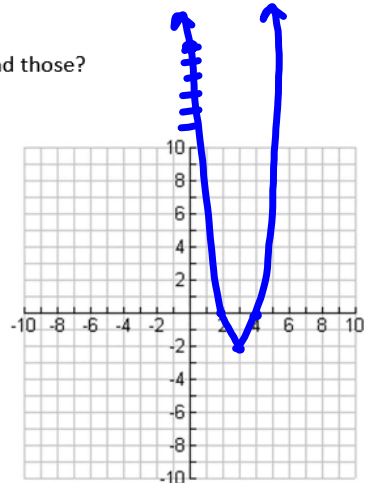
9. Find the x-intercept(s). Which equation helped you find the x-intercept(s)?

$x = 2, 4$ factored

10. Find the vertex and axis of symmetry. Which equation helped you find those?

$(3, -2)$ $x = 3$ vertex

11. Sketch the graph on the coordinate plane provided using the information gathered in #s 8-10.



12. Prove algebraically that $p(x)$, $f(x)$, and $v(x)$ are equivalent.

LABEL GRAPHS ON BACK

Name: _____ Hour: _____ **3 Forms Worksheet**

Three forms of quadratic equations and their characteristics – Fill in all blanks!

A	Standard Form: $y = x^2 + 2x - 35$	y-intercept: $(0, -35)$
	Factored Form: $y = (x+7)(x-5)$	x-intercept: $x = -7, 5$
	Vertex Form: $y = (x+1)^2 - 36$	Vertex: $(-1, -36)$
	$1 + (-2) - 35$ $-1 - 35$	$\frac{-2}{2(1)} = -\frac{2}{2} = -1$
B	Standard Form: $y = x^2 + 8x$ _____	y-intercept: _____
	Factored Form: _____	x-intercept: _____
	Vertex Form: $y = (x+4)^2 - 1$	Vertex: _____
C	Standard Form: $y = x^2 - 8x$ _____	y-intercept: _____
	Factored Form: $y = (x-4)(x-4)$	x-intercept: _____
	Vertex Form: _____	Vertex: _____

D	Standard Form: $y = x^2 + 8x - 15$ $-(x^2 - 8x + 15)$ $-(x-3)(x-5)$	y-intercept: $(0, -15)$
	Factored Form: $y = (-x+3)(x-5)$ $-\cancel{x}+3 = 0$ $+\cancel{x}$	x-intercept: $5, 3$
	Vertex Form: $y = -(x-4)^2 + 1$ $-(x-4)(x-4) + 1$	Vertex: $(4, 1)$ $x^2 - 4x - 4x + 16 = x^2 - 8x + 16$ $-(x^2 - 8x + 16) + 1$
E	Standard Form: $y = -x^2 - 6x + 16$	y-intercept: _____
	Factored Form: _____	x-intercept: _____
	Vertex Form: $y = -(x+3)^2 + 25$	Vertex: _____
F	Standard Form: _____	y-intercept: _____
	Factored Form: $y = (x-4)(x+4)$	x-intercept: _____
	Vertex Form: _____	Vertex: _____
G	Standard Form: $y = x^2 - 8x + 17$	y-intercept: _____
	Factored Form: _____	x-intercept: _____
	Vertex Form: _____	Vertex: _____

~~$\begin{matrix} 15 \\ -3 & -5 \\ -8 \end{matrix}$~~

$-x^2 + 8x - 15$
 $-x^2 + 8x - 16 + 1$

H Standard Form: _____ y-intercept: _____

Factored Form: $y = (x-3)(x-5)$ x-intercept: _____

Vertex Form: _____ Vertex: _____

I Standard Form: $y = -\frac{1}{2}x^2 + 4x$ _____ y-intercept: _____

Factored Form: $y = -\frac{1}{2}(x-3)(x-5)$ x-intercept: _____

Vertex Form: _____ Vertex: _____

J Standard Form: $y = x^2$ y-intercept: _____

Factored Form: _____ x-intercept: _____

Vertex Form: _____ Vertex: _____

Write the letter that matches each graph using the equations on the previous pages.

<p>A</p>	
<p>I</p>	<p>J</p>

