Bell Ringer

Tuesday 10/9

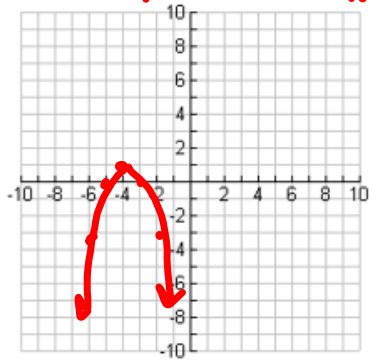
1-3: Identify the transformations made to the parent function f(x) = x^2

(3, 1) (−2, −7) (4, 0)

1. $f(x) = (x-3)^2 + 1$ up 1 right 3
2. $f(x) = -(x+2)^2 - 7$ left 2 down 7 flips down
3. $f(x) = -2(-x+4)^2$ +0 reflect over x-axis Stretch left 4 flip over y-axis

4. Graph the function $f(x) = -(x+4)^2 + 1$

(−4, 1)



Name:_____Hr:_____

Standard 3A Quiz Form A
(Solve quadratic equations)

Solve the following equations. Answers should be simplified and in exact form.

1. Solve: $4x^2 - 16x = 0$

$4x(x-4)=0$

$\frac{4x}{4}=\frac{0}{4}$ $x=0$ $x-4=0$ $+4\ +4$ $x=4$

a. 4 b. 2,−2 c. 4,−4 d. 0,4

2. Solve: $x^2 - 11x + 28 = 0$

28, -7×-4, -11

$(x-7)(x-4)=0$ $x-7=0$ $x-4=0$

a. −7,4 b. 7,−4 c. 7,4 d. 2,14

3. Solve: $2x^2 + 15x = 8$

$2x^2+15x-8=0$

-16, 16×-1, 15

$(2x^2+16x)+(-1x-8)=0$

$2x(x+8)-1(x+8)$

$(x+8)(2x-1)=0$

$x+8=0$ -8 $2x-1=0$ $\frac{1}{2}$

a. $\frac{1}{2}, -8$ b. 1,−8 c. −1,8 d. 1,16

4. Solve: $4x^2 = 36$

$\frac{4x^2}{4}=\frac{36}{4}$

$\sqrt{x^2}=\sqrt{9}$ $x=\pm 3$

a. 3 b. 3,−3 c. 9,−9 d. 9

5. Solve: $2x^2 - 8x = 1$

$2x^2-8x-1=0$

$\frac{8 \pm \sqrt{(-8)^2-4(2)(-1)}}{2(2)}$ $\frac{8\pm\sqrt{72}}{4}$

$\frac{4\pm 3\sqrt{2}}{2}$

$72 = 2 \cdot 36$

a. $2\pm 6\sqrt{2}$ b. $\frac{4\pm 3\sqrt{2}}{2}$ c. $\frac{4\pm\sqrt{19}}{2}$ d. $2\pm\sqrt{19}$

Please put answers here:

1. _____ **2.** _____ **3.** _____ **4.** _____ **5.** _____

Correct Ch 3 Translations 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. $f(x)=3x^2+1$

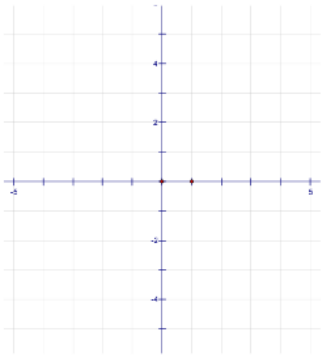
9. $f(x)=-(x+3)^2-5$

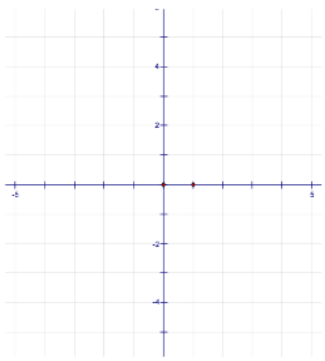
Sketch a graph of the function with the indicated transformations. (No Calculator)

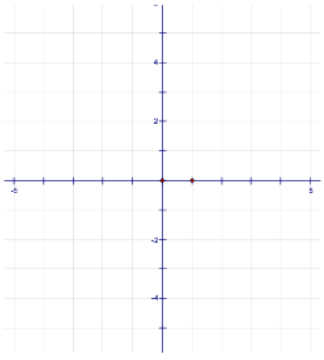
10. $f(x)=3(-x-5)^2+1$

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

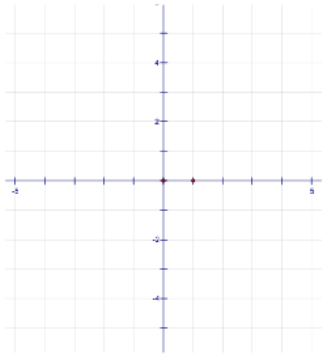
12. $f(x)=-\frac{1}{3}(-x+2)^2-2$



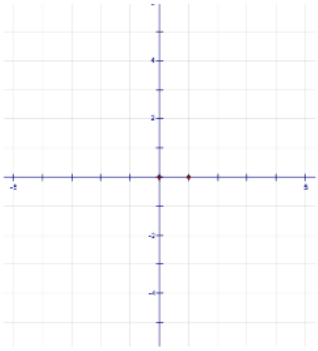




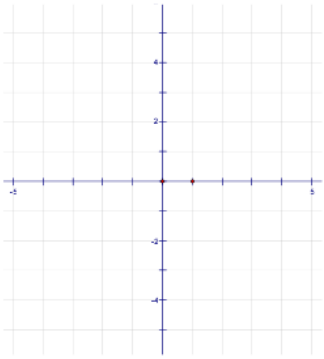
13. $f(x)=2(-x+1)^2-2$



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.

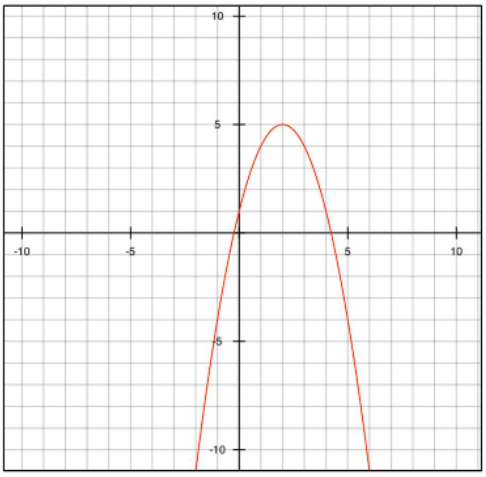
16. Vertical stretch by a factor of 3, horizontal shift left 5

17. Moved 4 units right and 5 units down.

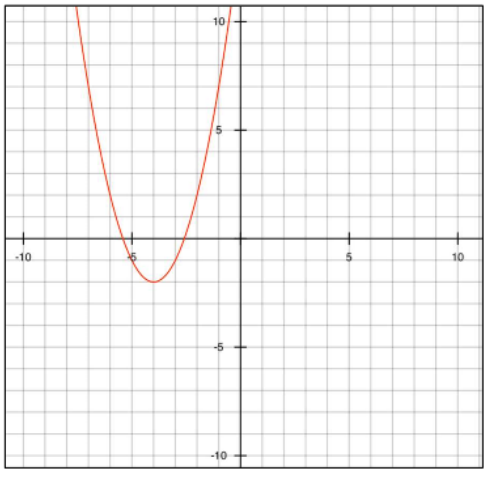
18. moved 6 units left and 2 units up.

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

19. _____



20. _____



Name KEY Hour Ch 3 Translations of Quadratic Functions

From vertex: out 1 up 1, 3 x by a
out 2 up 4

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

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

down 3

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

left 2

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

up 5

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

left 4
flipped over y-axis

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

flipped over x-axis
stretched

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

down 3
compressed

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

down 2
compressed

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

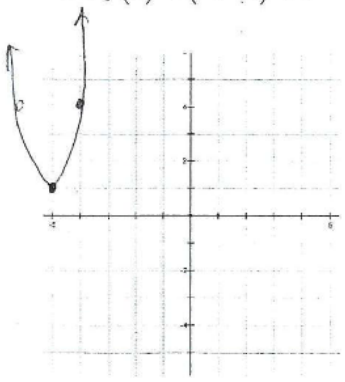
stretched
up 1

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

flipped over x-axis
left 3
down 5

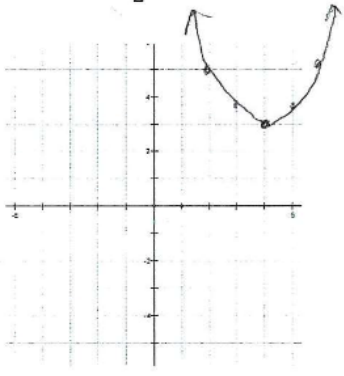
Sketch a graph of the function with the indicated transformations. (No Calculator)

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



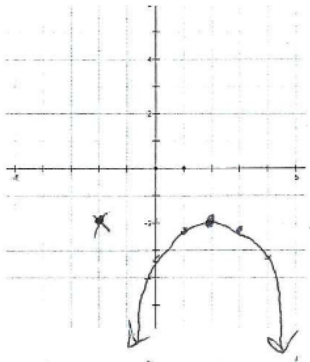
(5,1) flipped over y-axis
= (-5,1)

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



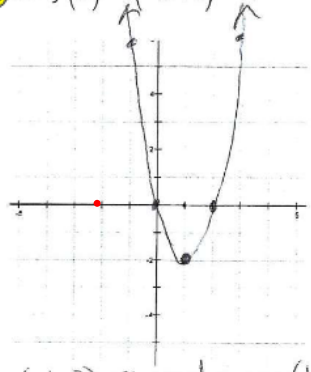
(4,3)

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



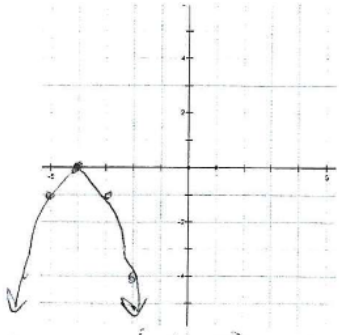
(-2,-2) flipped over y-axis
= (2,-2)

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



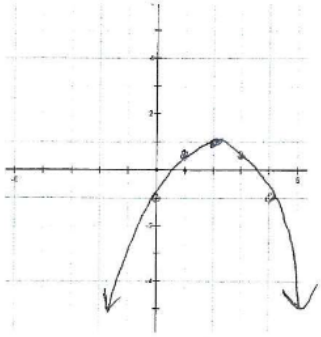
(-1,-2) flipped y-axis (1,-2)

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



(-4,0)

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



(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

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

17. Moved 4 units right and 5 units down.

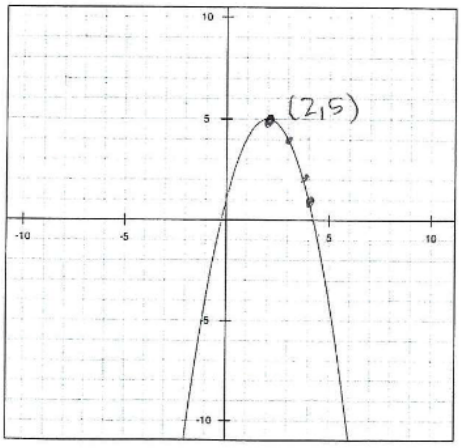
$f(x) = (x-4)^2-5$

18. moved 6 units left and 2 units up.

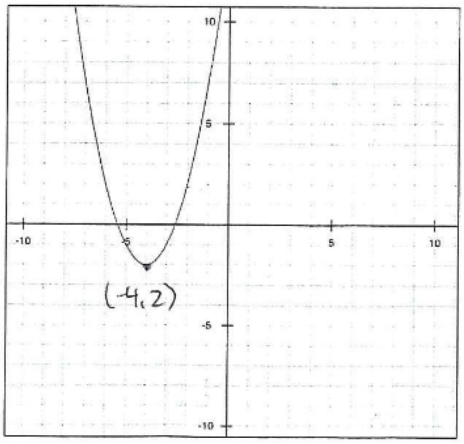
$f(x) = (x+6)^2+2$

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

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



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



Vertex Form A ws due tomorrow

5. $y = 2x^2 + 4x - 12$

$\frac{y}{2} = x^2 + 2x - 6$ $\left(\frac{2}{2}\right)^2$

$\frac{y}{2} = x^2 + 2x + 1 - 6 - 1$

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

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

6. $\frac{y}{-1} = \frac{-1x^2}{-1} + \frac{3x}{-1} + \frac{18}{-1}$

$\frac{y}{-1} = x^2 + 3x - 18$

$\frac{y}{-1} = x^2 + 3x + 2.25 - 18 - 2.25$

$\frac{y}{-1} = -1((x+1.5)^2 - 20.25)$

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

$x = -1.5$ $(-1.5, 20.25)$

Review: $f(x) = x^2 - 8x + 12$

$x^2 - 8x + 16 + 12 - 16$

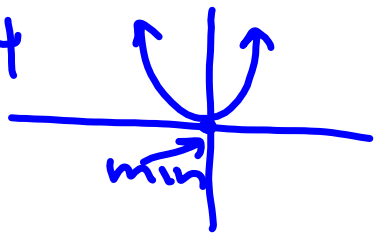
Vertex form: $f(x) = (x-4)^2 - 4$

Vertex: (4, -4)

Axis of Symmetry: $x = 4$

Max/Min: min

Y-Intercept (0, 12)



You can find the vertex in Standard Form... (h, k)

$f(x) = x^2 - 8x + 12$ (a = 1, b = -8, c = 12)

$h = \frac{-b}{2a}$ $\frac{-(-8)}{2(1)}$ $\frac{8}{2} = 4$ $k = f(h)$

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

$16 - 32 + 12$

$-16 + 12$

-4

(4, -4)

AOS: x = 4

y-int: (0, 12)

max/min?

Find the vertex and axis of symmetry

$$f(x) = x^2 + 10x - 4$$

vertex: $h = \frac{-10}{2(1)} = -5$ $(-5, -29)$ $f(-5) = (-5)^2 + 10(-5) - 4$ $25 - 50 - 4$ $-25 - 4$ -29

AOS: $x = -5$

y-int: $(0, -4)$

max/min? ∪ min

Find the vertex and axis of symmetry

$f(x) = 4x^2 + 16x$ (y)

$a = 4$, $b = 16$, $c = 0$

vertex: $(-2, -16)$

$\frac{-(16)}{2(4)}$ $\frac{-b}{2a}$

AOS: $x = -2$

$4(-2)^2 + 16(-2)$ $\frac{-16}{8} = -2$

$16 + -32$

-16

y-int: $(0, 0)$

max/min?

Find the vertex and axis of symmetry

$a=-3$ $b=12$ $c=8$

$$f(x) = -3x^2 + 12x + 8$$

vertex: $\left(\frac{-12}{2(-3)}, f(2)\right) = \left(\frac{-12}{-6}, \quad\right) = (2, 20)$

AOS: $x = 2$

y-int: $(0, 8)$

max/min?

Find the vertex and axis of symmetry

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

$a=-1$ $b=2$ $c=5$

vertex: $\left(\frac{-b}{2a} = \frac{-2}{2(-1)} = \frac{-2}{-2} = 1\right)$ $(1, 6)$

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

$-1+2+5$

AOS: $x=1$

y-int: $(0,5)$

max/min?

Vertex form, Standard form or both?

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

Std.

Vertex form, Standard form or both?

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

vert.

Vertex form, Standard form or both?

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

Vertex

Vertex form, Standard form or both?

Both $f(x)=2x^2-10$

Vertex form, Standard form or both?

$$f(x) = x^2 - 8x - 6$$

Std

Vertex form, Standard form or both?

$$f(x) = x^2 - 9$$

both

Vertex Form Worksheet B

Name: _____Hr:____

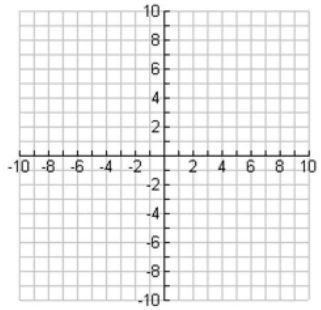
Axis of symmetry: x= $h = \frac{-b}{2a}$, $k = f(h)$ Vertex: (h, k) Vertex form: $y = a(x-h)^2 + k$

Use the formula $\left(-\frac{b}{2a}, \_\_\_\right)$ 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. $y = x^2 - 8x + 18$
4. $f(x) = -x^2 + 2x + 5$
5. $y = 2x^2 - x + 1$
6. $f(x) = x^2 - 8x + 16$

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)

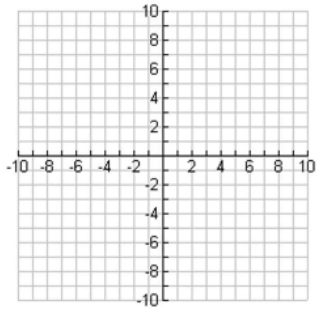
b)

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