

CHAPTER 12

TRANSFORMATIONS

PRACTICE ASSIGNMENTS

Intermediate ALGEBRA 2

Name: _____ HR: _____

Concept 1

Find the vertex and axis of symmetry (A.O.S.) for the following quadratic functions.

1. $f(x) = -(x - 6)^2 + 7$

Vertex: _____ A.O.S.: _____

Opens: _____

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

Vertex: _____ A.O.S.: _____

Opens: _____

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

Vertex: _____ A.O.S.: _____

Opens: _____

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

Vertex: _____ A.O.S.: _____

Opens: _____

5. $f(x) = 4(x + 3)^2 + 1$

Vertex: _____ A.O.S.: _____

Opens: _____

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

Vertex: _____ A.O.S.: _____

Opens: _____

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

Write the vertex form of the quadratic equation that has the given information.

7. Vertex: $(1, -4)$ A.O.S.: $x = 1$

$f(x) =$ _____

8. Vertex: $(-2, 0)$ A.O.S.: $x = -2$

$f(x) =$ _____

9. Vertex: $(0, -8)$ A.O.S.: $x = 0$

$f(x) =$ _____

10. Vertex: $(-5, 6)$ A.O.S.: $x = -5$

$f(x) =$ _____

11. Vertex: $(0, 0)$ A.O.S.: $x = 0$

$f(x) =$ _____

12. Vertex: $(-3, -6)$ A.O.S.: $x = -3$

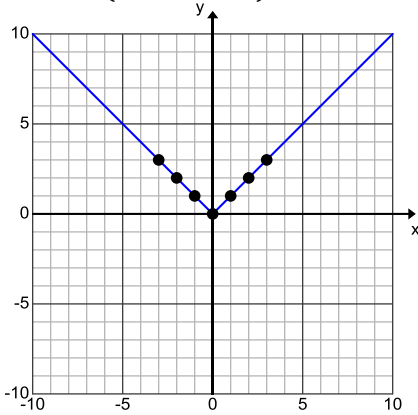
$f(x) =$ _____

Concept 2 – Graphing Absolute Value

- For the following functions: a) Identify the vertex point
b) Describe the transformation(s)
c) Sketch the graph of the given function

13) $f(x) = |x| + 4$

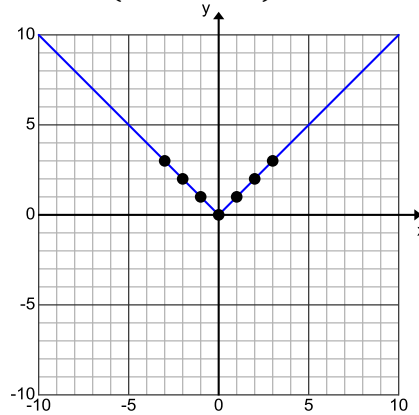
Vertex: (,)



Transformation(s):

14) $f(x) = |x - 2|$

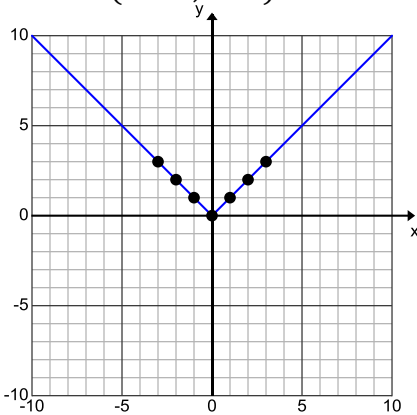
Vertex: (,)



Transformation(s):

15) $f(x) = |x - 4| + 2$

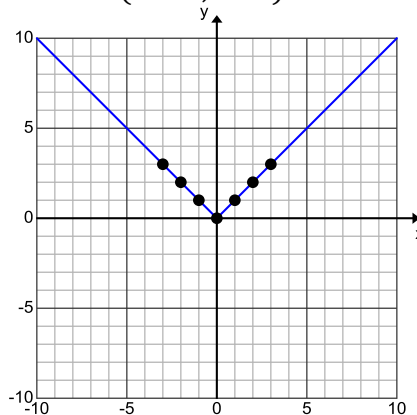
Vertex: (,)



Transformation(s):

16) $f(x) = |x + 5| + 1$

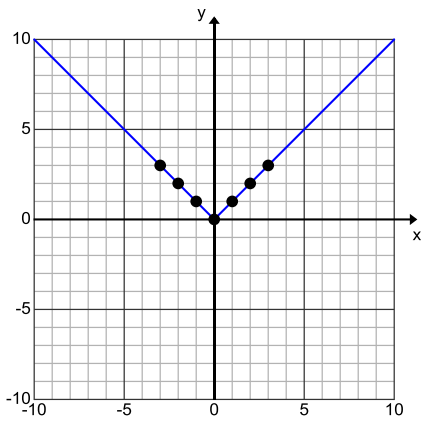
Vertex: (,)



Transformation(s):

17) $f(x) = |x+3| - 4$

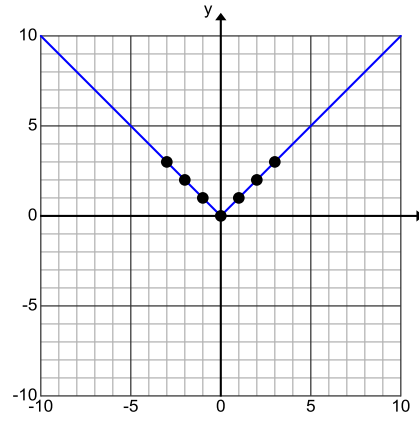
Vertex: (,)



Transformation(s):

18) $f(x) = |x - 6|$

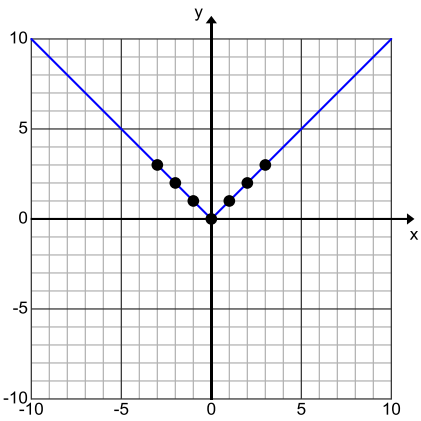
Vertex: (,)



Transformation(s):

19) $f(x) = |x + 2| + 7$

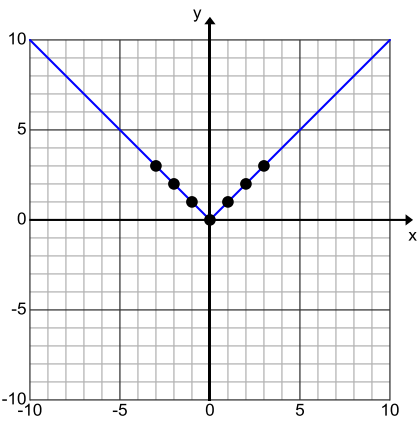
Vertex: (,)



Transformation(s):

20) $f(x) = |x| - 3$

Vertex: (,)



Transformation(s):

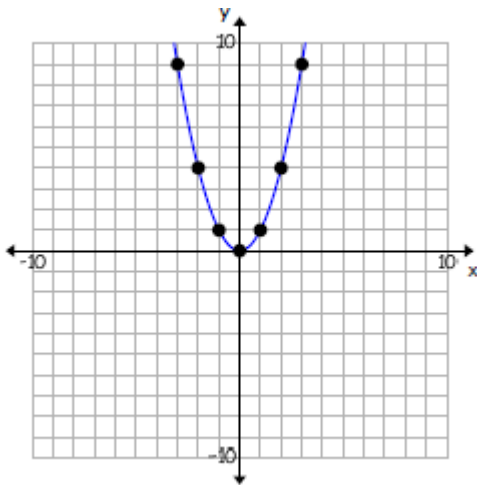
Concept 3

- For the following functions: a) Identify the vertex point and parent function
b) Describe the transformation
c) Sketch the graph of the given function

21) $f(x) = -(x)^2 + 8$

Vertex: (,)

Parent function:

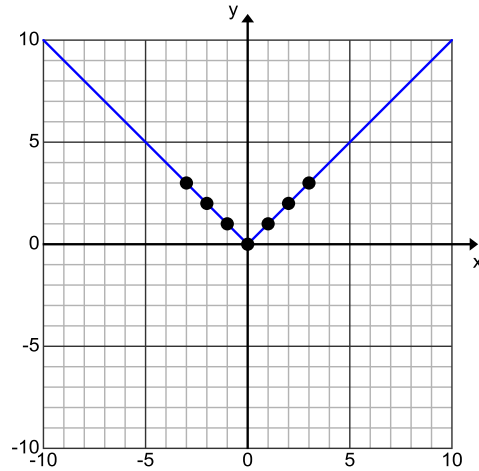


Transformation(s):

22) $f(x) = |x - 4|$

Vertex: (,)

Parent function:

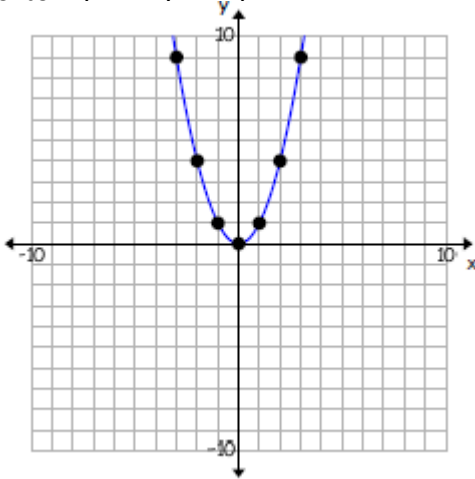


Transformation(s):

23) $f(x) = -(x - 3)^2 + 4$

Parent function:

Vertex: (,)

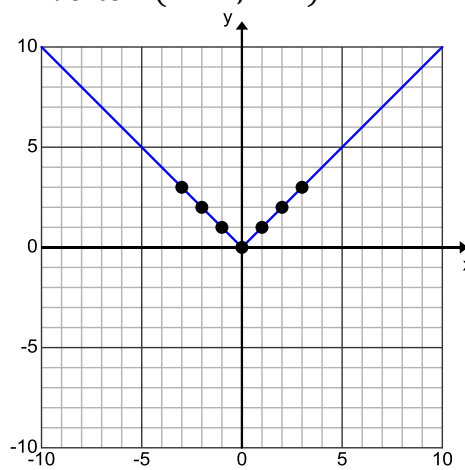


Transformation(s):

24) $f(x) = -|x + 1| + 6$

Parent function:

Vertex: (,)

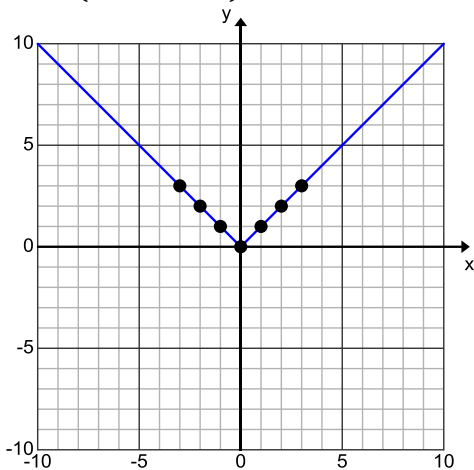


Transformation(s):

25) $f(x) = -|x + 5| - 1$

Parent function:

Vertex: (,)

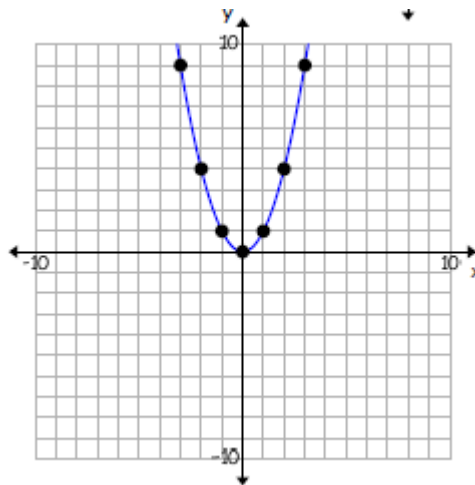


Transformation(s):

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

Parent function:

Vertex: (,)

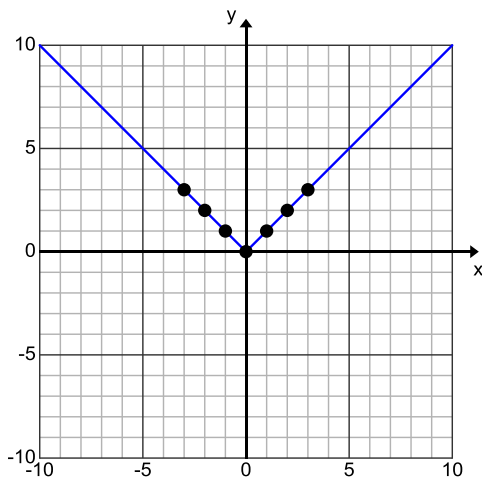


Transformation(s):

27) $f(x) = -|x + 4| + 8$

Parent function:

Vertex: (,)

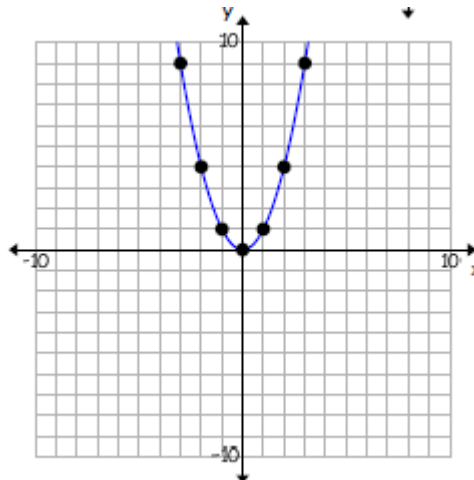


Transformation(s):

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

Parent function:

Vertex: (,)

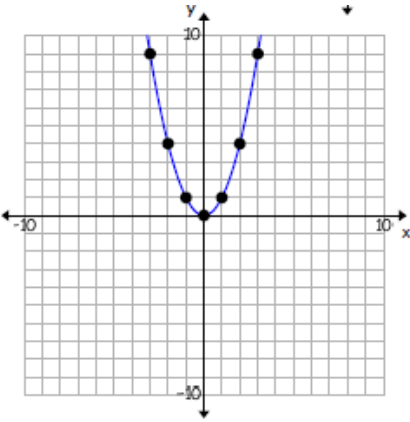


Transformation(s):

Concept 4

The graph of the original parent function $f(x) = x^2$ or $f(x) = |x|$ is already done. Now sketch the graph of the new function and record the vertex. Describe the transformation(s).

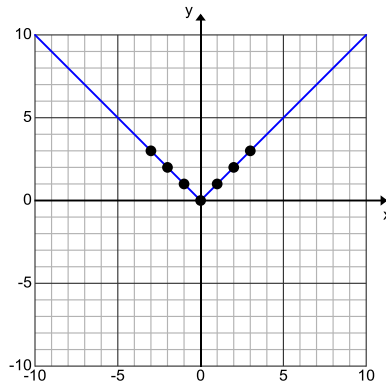
29) $f(x) = (x-1)^2 - 2$



Vertex: (,)

Transformations:

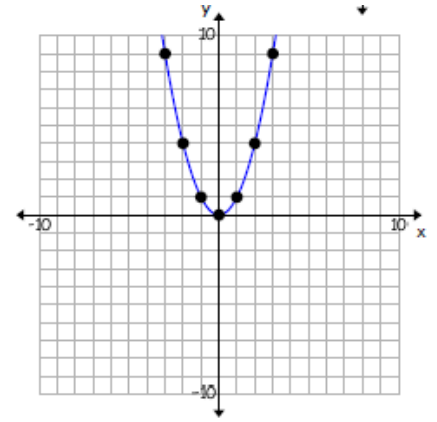
30) $f(x) = |x + 7| - 3$



Vertex: (,)

Transformations:

31) $f(x) = -(x + 5) + 8$



Vertex: (,)

Transformations:

Write the equation for the graph described from the original graph of $f(x) = x^2$.

32) Translated 2 units down

$f(x) = \underline{\hspace{1cm}} (\underline{\hspace{1cm}})^2 \underline{\hspace{1cm}}$

33) Translated 6 units up

$f(x) = \underline{\hspace{1cm}} (\underline{\hspace{1cm}})^2 \underline{\hspace{1cm}}$

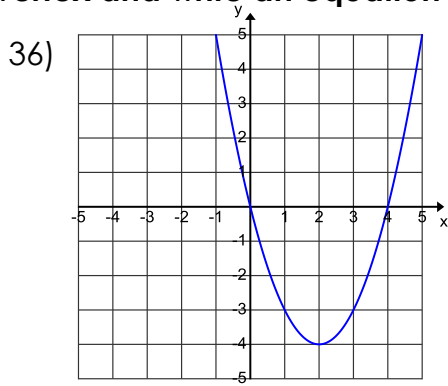
34) Translated 4 units to the left

$f(x) = \underline{\hspace{1cm}} (\underline{\hspace{1cm}})^2 \underline{\hspace{1cm}}$

35) Translated 5 units to the right and reflected over the x-axis

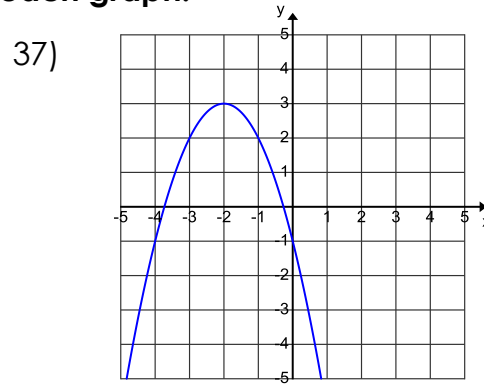
$f(x) = \underline{\hspace{1cm}} (\underline{\hspace{1cm}})^2 \underline{\hspace{1cm}}$

Each of the graphs below represents a transformation of the graph $f(x) = x^2$. Identify the vertex and write an equation in vertex form for each graph.



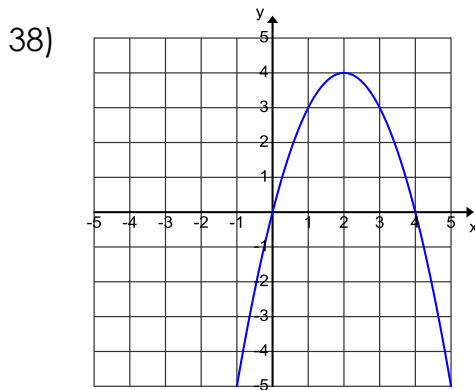
Vertex: (,)

$f(x) =$ _____



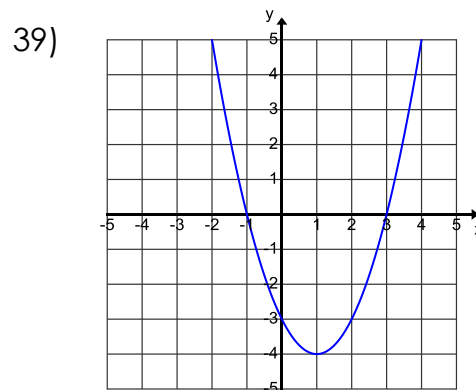
Vertex: (,)

$f(x) =$ _____



Vertex: (,)

$f(x) =$ _____



Vertex: (,)

$f(x) =$ _____

For each problem, identify whether the graph of the parabola opens up/down and has a max/min. Find the equation for the axis of symmetry and the vertex. Then state how far left/right and up/down the graph would move.

40) $f(x) = (x - 1)^2 - 4$

Vertex: _____

Max/Min

A.O.S.: _____

Opens Up/Opens Down

Shifts Left or Right _____

Shifts Up or Down _____

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

Vertex: _____

Max/Min

A.O.S.: _____

Opens Up/Opens Down

Shifts Left or Right _____

Shifts Up or Down _____

42) $f(x) = (x + 5)^2 - 7$

Vertex: _____

Max/Min

A.O.S.: _____

Opens Up/Opens Down

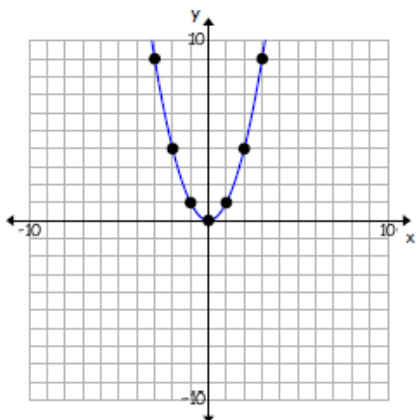
Shifts Left or Right _____

Shifts Up or Down _____

Chapter 12 Practice Test

The graph of the original parent function $f(x) = x^2$ is already done. Now sketch the graph of the new function and record the vertex. Describe the transformation(s).

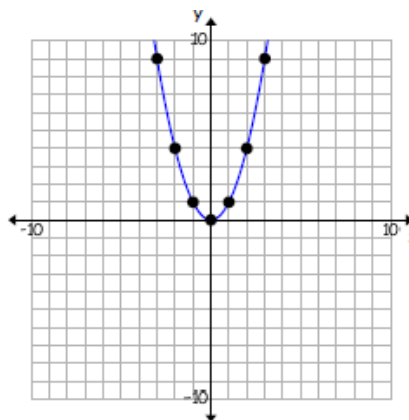
1) $f(x) = x^2 - 5$



Vertex: (,)

Transformation:

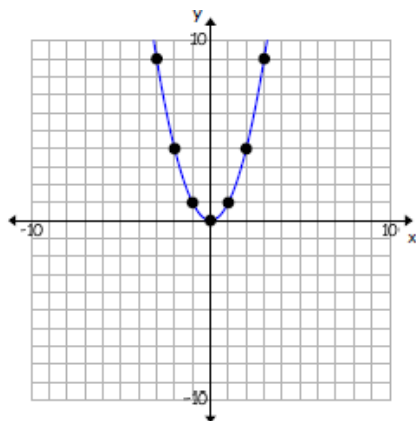
2) $f(x) = -(x+8)^2$



Vertex: (,)

Transformation:

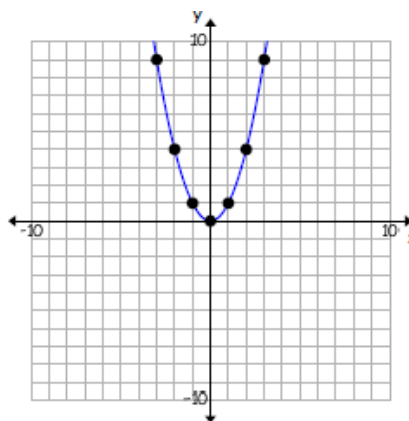
3) $f(x) = (x - 3)^2 - 1$



Vertex: (,)

Transformation:

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



Vertex: (,)

Transformation:

Write the equation for the graph described from the original graph of $f(x) = x^2$.

5) Translated 1 units left

$f(x) =$ _____

6) Translated 4 units down

$f(x) =$ _____

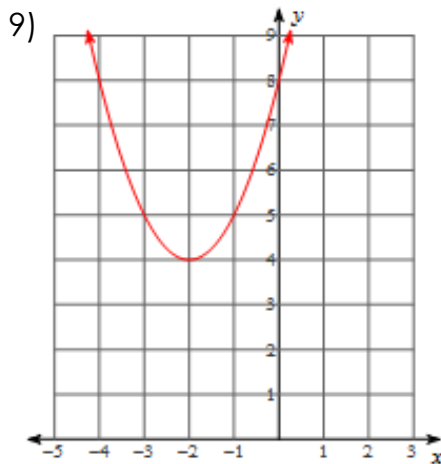
7) Translated 2 units right and 7 units up

$f(x) =$ _____

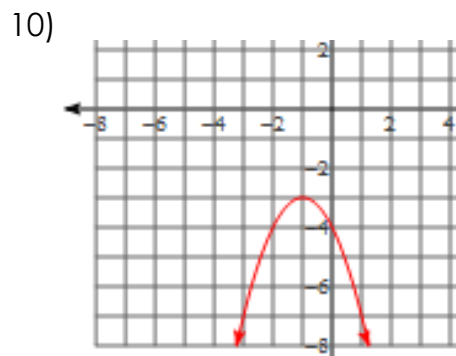
8) Reflected over the x-axis and 5 down

$f(x) =$ _____

Each of the graphs below represents a transformation of the graph $f(x) = x^2$. Write an equation in vertex form for each graph. (Hint: Find the vertex FIRST!)



$f(x) =$ _____



$f(x) =$ _____

For each problem, identify whether the graph of the parabola opens up/down and has a max/min. Find the equation for the axis of symmetry and the vertex. Then state how far left/right and up/down the graph would move.

11) $f(x) = (x + 4)^3 - 2$

Vertex: _____

Max/Min

A.O.S.: _____

Opens Up/Opens Down

Shifts Left or Right _____

Shifts Up or Down _____

12) $f(x) = -(x - 3)^2 + 6$

Vertex: _____

Max/Min

A.O.S.: _____

Opens Up/Opens Down

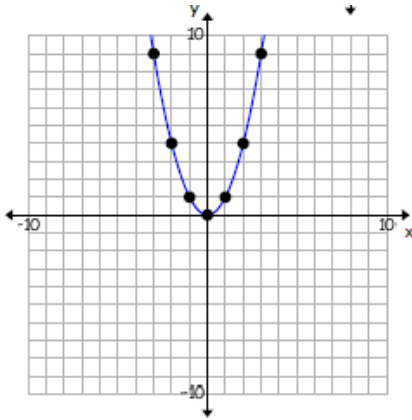
Shifts Left or Right _____

Shifts Up or Down _____

Extra Practice

The graph of the original parent function $f(x) = x^2$ or $f(x) = |x|$ is already done. Now sketch the graph of the new function and record the vertex. Describe the transformation(s).

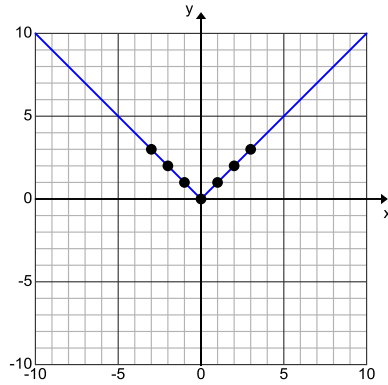
1) $f(x) = (x + 5)^2 - 1$



Vertex: _____

Transformation(s):

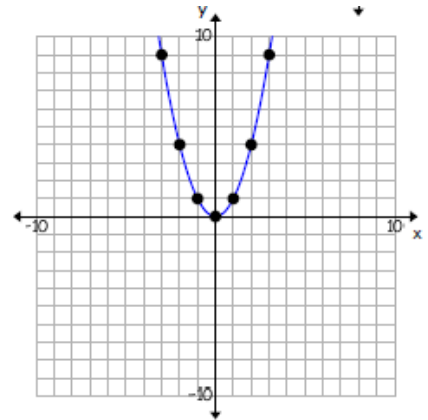
2) $f(x) = -|x - 3| + 8$



Vertex: _____

Transformation(s):

3) $f(x) = (x + 3)^2 - 4$



Vertex: _____

Transformation(s):

Write the equation for the graph described from the original graph of $f(x) = x^2$.

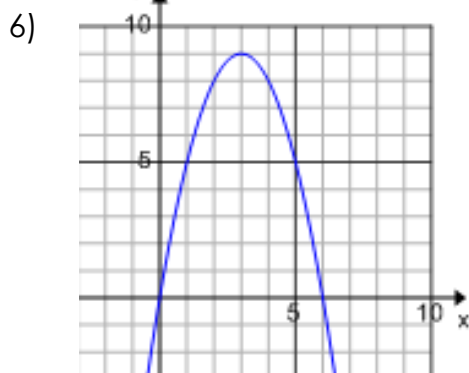
4) Translated 9 units up and 3 units to the right

$f(x) =$ _____

5) Reflected over the x-axis and 7 units to the left

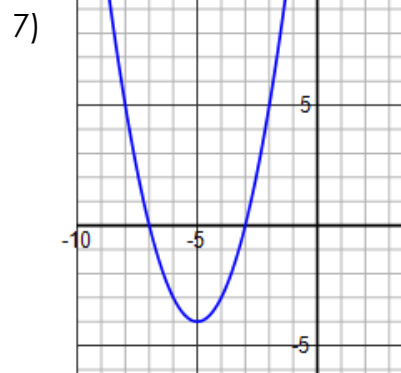
$f(x) =$ _____

Each of the graphs below represents a transformation of the graph $f(x) = x^2$. Write an equation in vertex form for each graph.



Vertex: (____, ____) $a \rightarrow +$ or $-$

$f(x) =$ _____



Vertex: (____, ____) $a \rightarrow +$ or $-$

$f(x) =$ _____

For each problem, identify whether the graph of the parabola opens up/down and has a max/min. Find the vertex.

$$8) f(x) = (x + 6)^2 - 1$$

Vertex: _____

Max/Min

A.O.S.: _____

Opens Up/Opens Down

Shifts Left or Right _____

Shifts Up or Down _____

$$9) f(x) = -(x - 8)^2 + 11$$

Vertex: _____

Max/Min

A.O.S.: _____

Opens Up/Opens Down

Shifts Left or Right _____

Shifts Up or Down _____