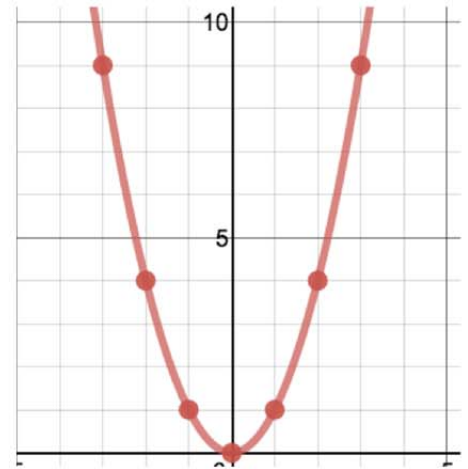


10.2 Quadratics in Vertex Form

ALGEBRA

Quadratic Function:

x	x^2
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9



Vertex:

Axis of Symmetry:

If $a > 0$:

if $a < 0$:

If $|a| > 1$:

If $0 < |a| < 1$:

Write your questions here!



-Ex 1:

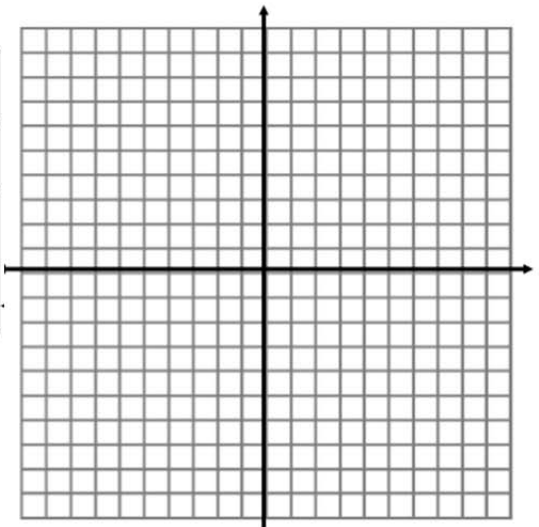
Vertex:

Max/Min:

Axis of Symmetry:

Function in standard form:

x	$f(x)$



Y-int:

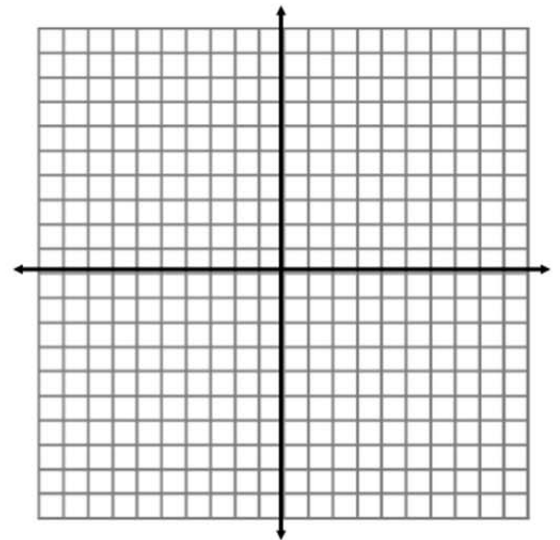
-Ex 2:

Vertex:

Max/Min:

Axis of Symmetry:

Function in standard form:



Y-int:

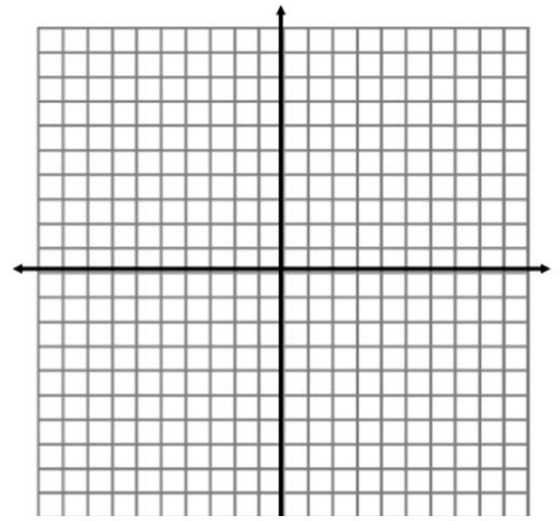
-Ex 3:

Vertex:

Max/Min:

Axis of Symmetry:

Function in standard form:



Y-int:

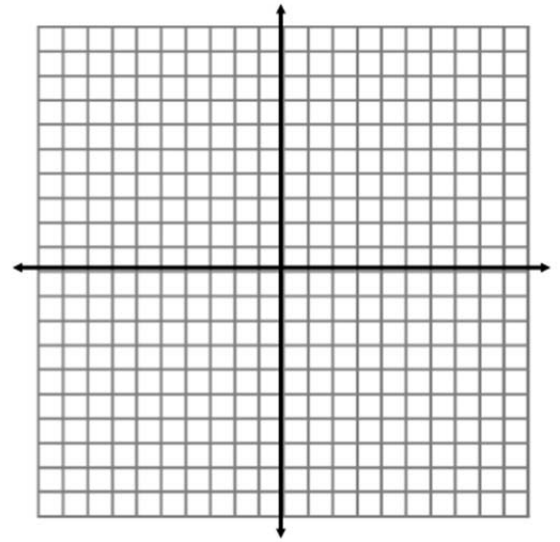
-Ex 4:

Vertex:

Max/Min:

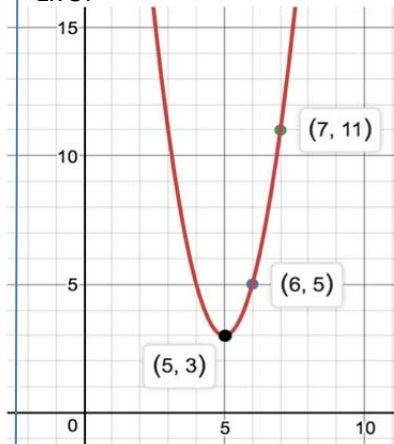
Axis of Symmetry:

Function in standard form:



Y-int:

Ex 5:



a. Write the equation of the graph in vertex form.

b. Compare $f(x) = -(x + 3)^2 + 4$ to the graph. Describe differences and similarities.

SUMMARY:

Now,
summarize
your notes
here!



Directions: Pick the best answer.

1) Which of the following is true about the quadratic function $f(x) = (x - 4)^2 + 5$.

- a) It has a max value at $y = 5$.
- b) It has a min value at $y = 4$.
- c) It has a max value at $y = 4$.
- d) It has a min value at $y = 5$.

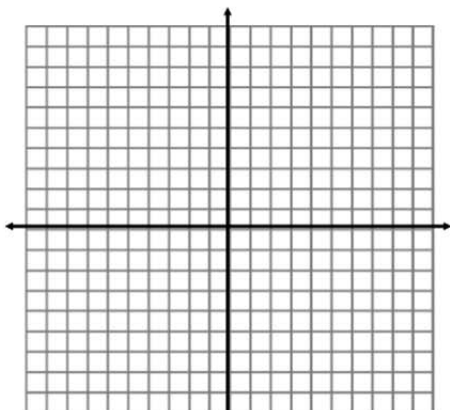
2) Which of the following is true about the quadratic function $f(x) = -2(x - 4)^2 + 5$.

- a) It is skinnier than its parent function and opens down.
- b) It is skinnier than its parent function and opens up.
- c) It is wider than its parent function and opens down.
- d) It is wider than its parent function and opens up.

Directions: Graph each function. Then answer the questions. Plot the vertex and at least 2 other points, more if possible.

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

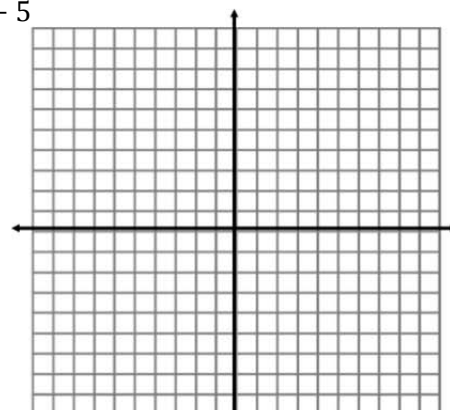
Standard form:



Y-int:

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

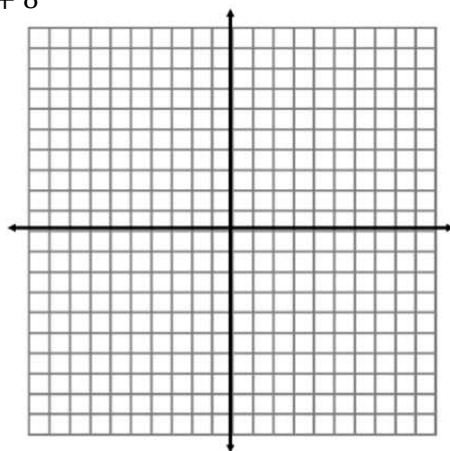
Standard form:



Y-int:

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

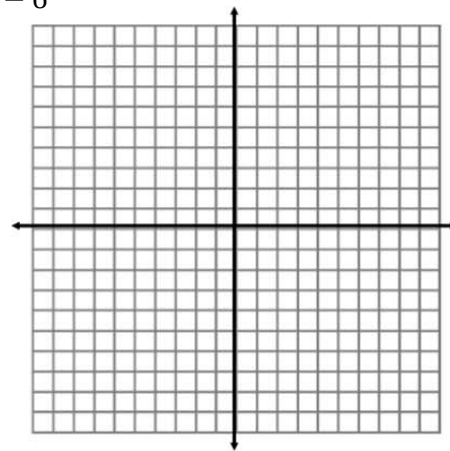
Standard form:



Y-int:

6) $f(x) = 0.5(x - 4)^2 - 6$

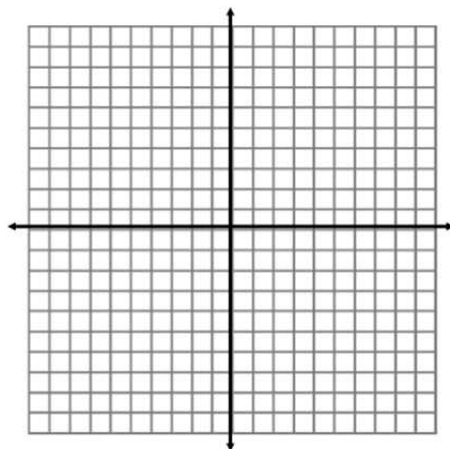
Standard form:



Y-int:

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

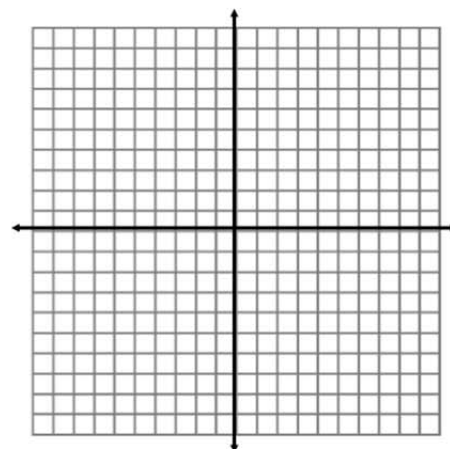
Standard form:



Y-int:

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

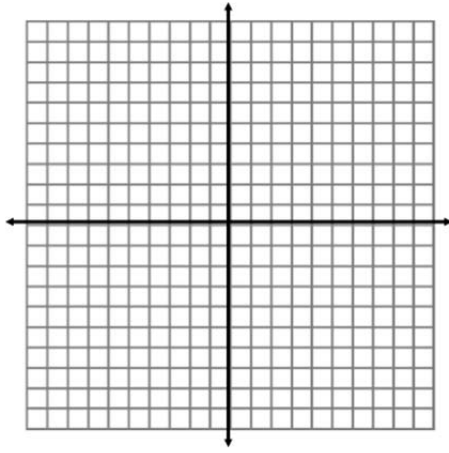
Standard form:



Y-int:

9) $f(x) = 2(x - 4)^2 - 9$

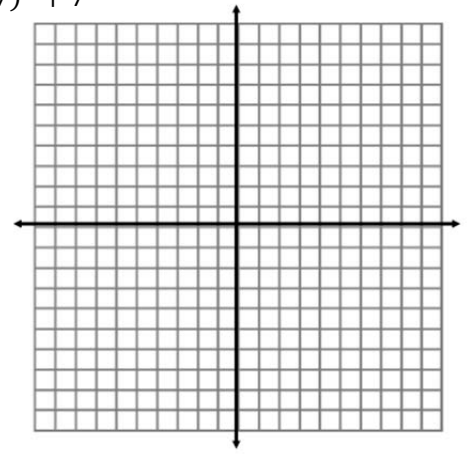
Standard form:



Y-int:

10) $f(x) = -0.5(x + 7)^2 + 7$

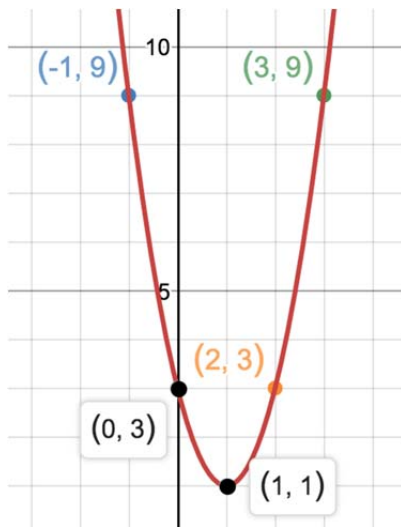
Standard form:



Y-int:

Directions: a) Write the equation of each function. b) Compare the graph to the given function.

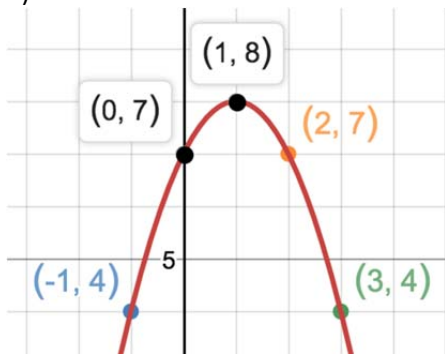
11)



a) What is the equation of the function?

b) Compare the graph to $f(x) = (x - 1)^2 - 1$

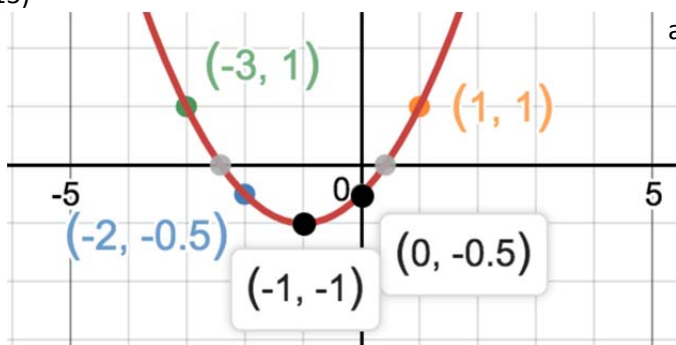
12)



a) What is the equation of the function?

b) Compare the graph to $f(x) = (x - 1)^2 - 1$

13)



a) What is the equation of the function?

b) Compare the graph to $f(x) = (x - 1)^2 - 1$

Use the piecewise function to evaluate the following.

$$14) f(x) = \begin{cases} -2x^2 - 1, & x \leq 2 \\ \frac{4}{5}x - 4, & x > 2 \end{cases}$$

a) $f(0) =$

b) $f(5) =$

c) $f(2) =$

d) $f(-3) =$

Directions: Factor.

15) $3x^2 + 10x - 8$

16) $h^2 + 3h - 54$

17) $6x^2 - 15x - 36$

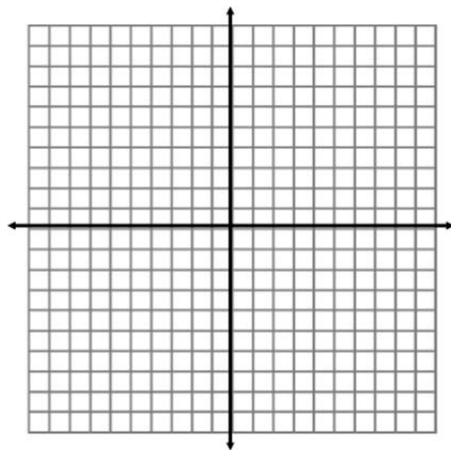
10.2 Quadratics in Vertex Form

WRAP UP

Directions: Graph each function. Then answer the questions. Plot the vertex and at least 2 other points, more if possible.

1) $f(x) = -2(x + 1)^2 + 9$

Standard form:



Y-int:

Directions: Compare the following function to the function in #1. Describe differences and similarities.

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

3) Mr. Kelly develops a machine that can catapult water balloons into the sky. He intends to use this machine to crash the annual End of Year Alge-Bash by using the machine to launch the balloons over Mr. Bean's house into his backyard. Mr. Kelly determines that the motion of the ball could be described by the function:

$$h(t) = -16(t - 4)^2 + 260$$

where t represents the time the balloons are in the air in seconds and $h(t)$ represents the height of the water balloons, in feet, of the ball above the ground at time t .

a) Draw a pic of the situation.

b) What information can we gather from function that might be helpful? How can Mr. Kelly use this information to help in his planning?

SMP #2

c) How far off the ground is the machine when it launches the water balloons? (hint: what's it called when $t = 0$? What form aside from vertex form might be helpful in finding it?)

EXIT TICKET –

Graph the following: $f(x) = (x + 2)^2 - 9$

a) Label the vertex.

b) Put the equation in standard form.

c) Label the y-intercept.

d) Put the function in factored form.

e) Label the x-intercepts.

