

Name: _____ Algebra 10 Unit 8 Lesson 1

Introduction to Quadratic Functions

DO NOW ~ Friday 12/6

How do you feel the Unit 7 Test went for you? _____



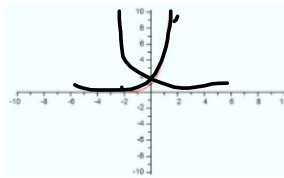
Classwork

Do you remember the difference between LINEAR functions & EXPONENTIAL functions?

$y = 5x - 3$

**A LINE**

$y = 5^x$

**A CURVE**

$y = ax^2 + bx + c$

Circle the choices below that are quadratic functions.

$y = x^2 - 3$

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

$y = x^2 + \sqrt{x} + 7$

$y = 10 - x^2$

An Example: $-4x^2 + 5x - 2$ Given the quadratic function $y = 10 - 3x^2 + 7x$, write it in standard form and state the value of the leading coefficient.Standard Form: $y = -3x^2 + 7x + 10$ Leading Coefficient: -3 If $f(x) = 2x^2 - 3x + 1$, then find, without using your calculator, the value of $f(-2)$. What point must lie on this quadratic's graph based on this calculation?

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

$f(-2) = \underline{\hspace{2cm}}$

DO NOW ~ Tuesday 12/10

Which of the following is a quadratic function?

Line (1) $y = 3x - 2$ (3) $y = x^2 - 4$ Quadratic
~~(2) $y = x^3 + 2x^2 - 1$~~ (4) $y = 6(2)^x$

[•] (0)
-∞, ∞

Exponential

Classwork

Consider the simplest of all quadratic functions, $f(x) = x^2$

Fill out the following table:

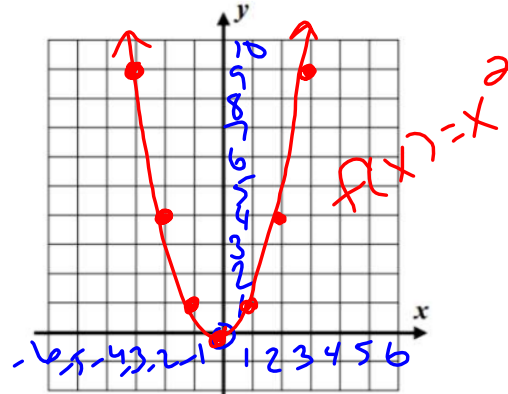
x	-3	-2	-1	0	1	2	3
$y = x^2$	9	4	1	0	1	4	9

(-3, 9)

Vertex

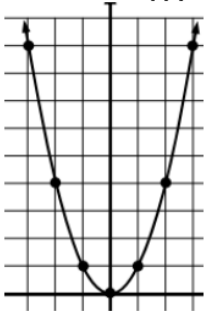
 $y = x^2$

Graph the function on the grid shown.

What is the **range** of this quadratic function? $[0, \infty)$ $y \geq 0$ ***Parabola*** $a > 0$ parabola opens

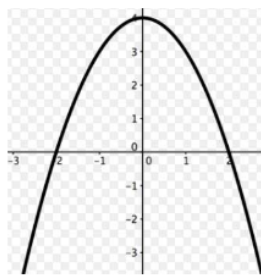
UP (smile) 😊

Positive = Happy

 $y = 2x^2$ $a < 0$ parabola opens DOWN

(frown) ☹️

Negative = Sad

 $y = -4x^2$ Consider the quadratic function $y = x^2 - 2x - 8$.Use your **graphing calculator** to table and graph this quadratic function.What is the **range**? _____Where is the function **increasing**? _____

DO NOW ~ Wednesday 12/11

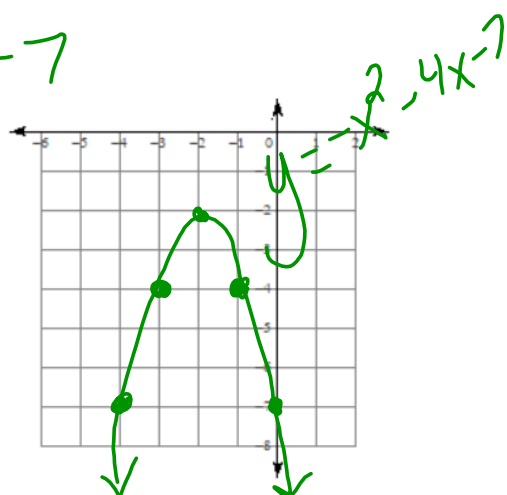
Is $-3x^2 + 2x - 5$ a quadratic function? How do you know?yes! x^2 

Classwork

Graph the following quadratic functions using the table and label method:

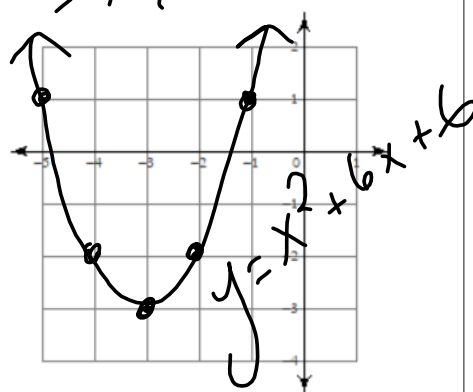
$$y = -x^2 - 4x - 7$$

x	y
-3	-4
-2	-3
-1	-4
0	-7

parabola
5 points

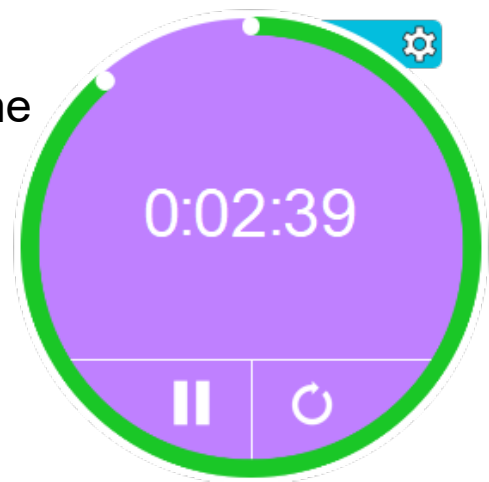
$$y = x^2 + 6x + 6$$

x	y
-1	1
-2	-2
-3	-3
-4	-2
-5	1



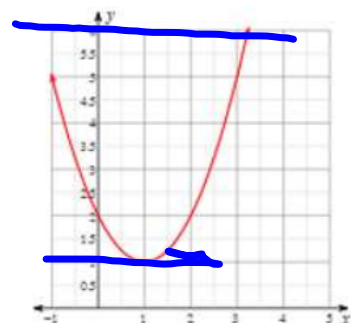
To earn your full participation point for the Do Now be sure to have completed all of the following by the time is up:

- 1) Be in your seat
- 2) Take out your calculator or grab one
- 3) Have last night's homework out
- 4) Complete the do now



DO NOW ~ Thursday 12/12

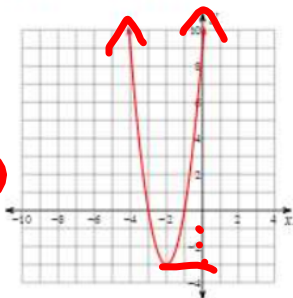
Identify the RANGE of the following quadratic function:

 $[1, \infty)$ $y \geq 1$ 

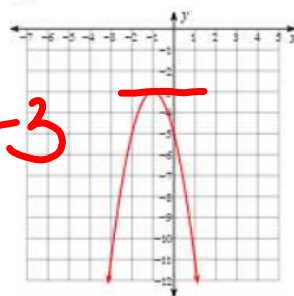
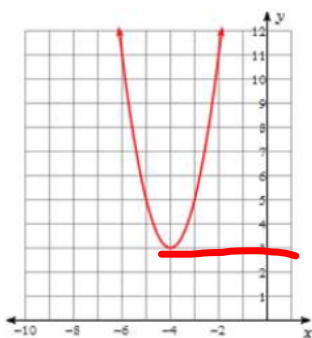
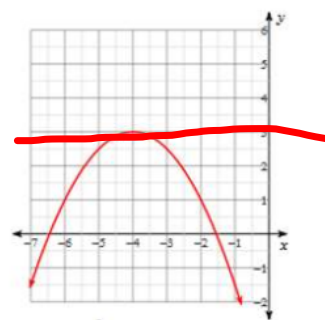
Classwork

Identify the range of the following quadratic functions:

3) $y = 3x^2 + 12x + 9$

 $y \geq -3$

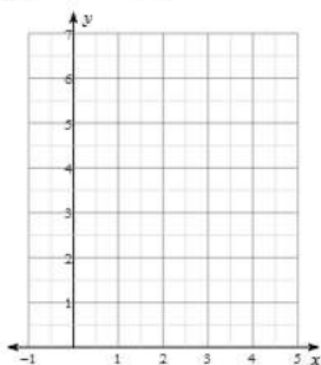
4) $y = -2x^2 - 4x - 5$

 $y \leq -3$  $y \geq 3$  $y \leq 3$

Mrs. Ferreri's Station ~ Graphing Parabolas

(A) Graph each of the quadratic functions using the table & label method. (B) Write the equation for the axis of symmetry. ($x = \#$) (C) Identify the vertex (turning point) (x,y) (D) State the RANGE of the function.

1) $y = x^2 - 4x + 6$

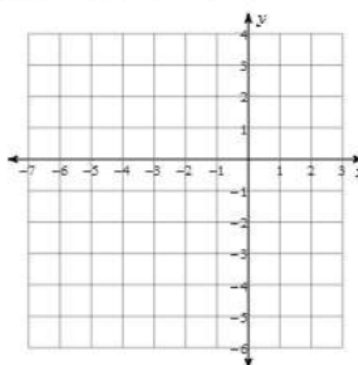


B) Axis of symmetry ($x = \#$): _____

C) Identify the vertex (turning point) (x,y): _____

D) State the RANGE (y values): _____

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

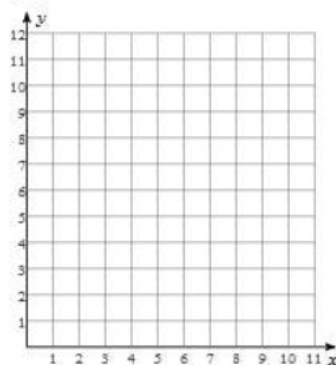


B) Axis of symmetry ($x = \#$): _____

C) Identify the vertex (turning point) (x,y): _____

D) State the RANGE (y values): _____

3) $y = 2x^2 - 16x + 35$

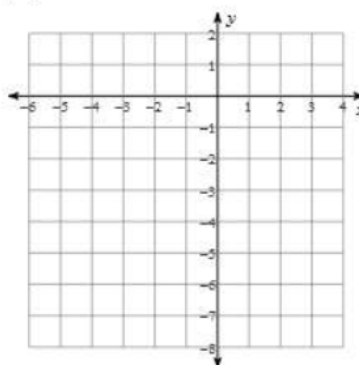


B) Axis of symmetry ($x = \#$): _____

C) Identify the vertex (turning point) (x,y): _____

D) State the RANGE (y values): _____

4) $y = -2x^2 - 12x - 17$



B) Axis of symmetry ($x = \#$): _____

C) Identify the vertex (turning point) (x,y): _____

D) State the RANGE (y values): _____

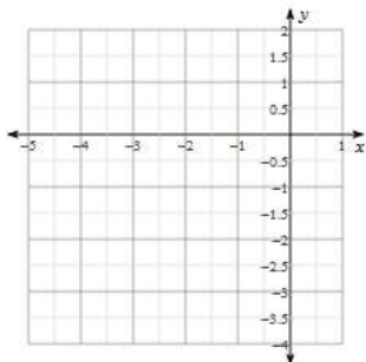
Computer Station ~ *Delta Math*

Complete the Assignment called, "Parabolas."

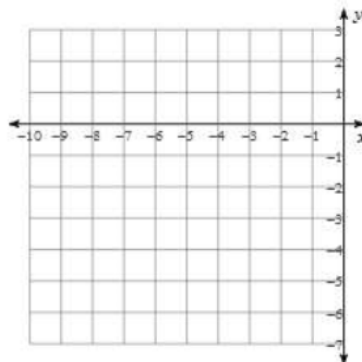
Mrs. Kennedy's Station ~ Graphing Quadratic Functions

Consider the following functions. Use a graphing calculator to create an accurate graph of $f(x)$ on the grid. (Use the table and label method).

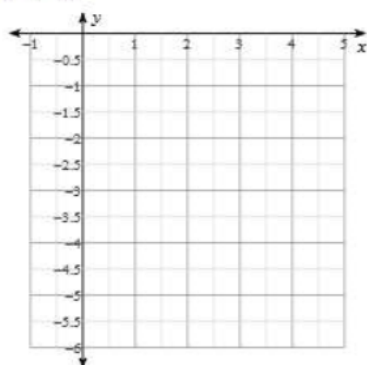
1) $f(x) = -x^2 - 2x$



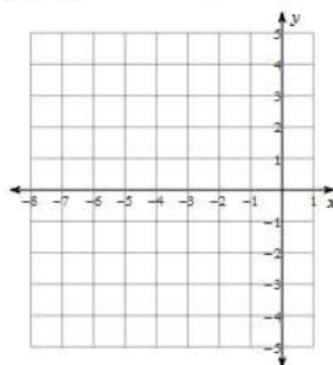
2) $f(x) = -2x^2 - 8x - 6$



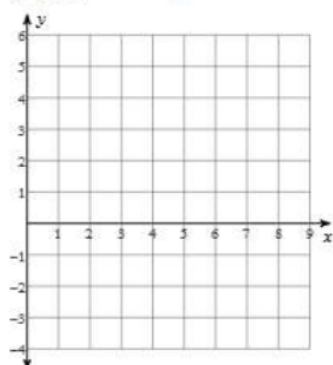
3) $f(x) = -x^2 + 2x - 2$



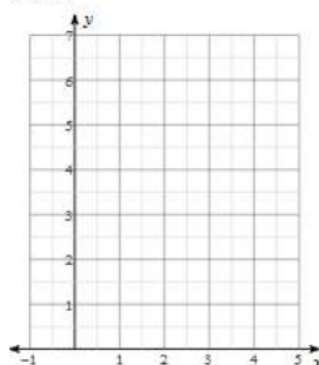
4) $f(x) = -2x^2 - 16x - 28$



5) $f(x) = 2x^2 - 16x + 29$



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



Independent Station ~ What point must lie on the Quadratic function?

Consider the following quadratic functions. What point must lie on each quadratic function?

If $f(x) = -2x^2 + 4x - 5$, then find the value of $f(-2)$. What point must lie on this quadratic graph based on this calculation?

$$f(-2) = \underline{\hspace{2cm}} \quad \text{Point: } \underline{\hspace{2cm}}$$

If $f(x) = -2x^2 - 8x - 7$, then find the value of $f(4)$. What point must lie on this quadratic graph based on this calculation?

$$f(4) = \underline{\hspace{2cm}} \quad \text{Point: } \underline{\hspace{2cm}}$$

If $f(x) = x^2 - 4x + 6$, then find the value of $f(2)$. What point must lie on this quadratic graph based on this calculation?

$$f(2) = \underline{\hspace{2cm}} \quad \text{Point: } \underline{\hspace{2cm}}$$

If $f(x) = -x^2 + 6x - 12$, then find the value of $f(1)$. What point must lie on this quadratic graph based on this calculation?

$$f(1) = \underline{\hspace{2cm}} \quad \text{Point: } \underline{\hspace{2cm}}$$

If $f(x) = -4x^2 - 8x - 5$, then find the value of $f(3)$. What point must lie on this quadratic graph based on this calculation?

$$f(3) = \underline{\hspace{2cm}} \quad \text{Point: } \underline{\hspace{2cm}}$$

If $f(x) = -2x^2 - 16x - 36$, then find the value of $f(-1)$. What point must lie on this quadratic graph based on this calculation?

$$f(-1) = \underline{\hspace{2cm}} \quad \text{Point: } \underline{\hspace{2cm}}$$

Continue onto the next page.

If $y = -x^2 - 4x + 9$, then find the value of $f(-1)$. What point must lie on this quadratic graph based on this calculation?

$f(-1) = \underline{\hspace{2cm}}$ Point: $\underline{\hspace{2cm}}$

If $f(x) = x^2 + 2x - 3$, then find the value of $f(2)$. What point must lie on this quadratic graph based on this calculation?

$f(2) = \underline{\hspace{2cm}}$ Point: $\underline{\hspace{2cm}}$

If $y = x^2 - 2x - 8$, then find the value of $f(0)$. What point must lie on this quadratic graph based on this calculation?

$f(0) = \underline{\hspace{2cm}}$ Point: $\underline{\hspace{2cm}}$

If $y = 2x^2 - 4x + 4$, then find the value of $f(1)$. What point must lie on this quadratic graph based on this calculation?

$f(1) = \underline{\hspace{2cm}}$ Point: $\underline{\hspace{2cm}}$

If $y = -2x^2 + 12x - 15$, then find the value of $f(3)$. What point must lie on this quadratic graph based on this calculation?

$f(3) = \underline{\hspace{2cm}}$ Point: $\underline{\hspace{2cm}}$

If $y = -2x^2 - 4x - 1$, then find the value of $f(0)$. What point must lie on this quadratic graph based on this calculation?

$f(0) = \underline{\hspace{2cm}}$ Point: $\underline{\hspace{2cm}}$

Continue onto the next page.

If $y = 2x^2 + 12x + 22$, then find the value of $f(-3)$. What point must lie on this quadratic graph based on this calculation?

$$f(-3) = \underline{\hspace{2cm}} \quad \text{Point: } \underline{\hspace{2cm}}$$

If $y = x^2 - 8x + 12$, then find the value of $f(2)$. What point must lie on this quadratic graph based on this calculation?

$$f(2) = \underline{\hspace{2cm}} \quad \text{Point: } \underline{\hspace{2cm}}$$

If $y = 2x^2 - 12x + 14$, then find the value of $f(1)$. What point must lie on this quadratic graph based on this calculation?

$$f(1) = \underline{\hspace{2cm}} \quad \text{Point: } \underline{\hspace{2cm}}$$

If $y = -3x^2 + 24x - 45$, then find the value of $f(5)$. What point must lie on this quadratic graph based on this calculation?

$$f(5) = \underline{\hspace{2cm}} \quad \text{Point: } \underline{\hspace{2cm}}$$

If $y = -\frac{1}{2}x^2 - 2x - 4$, then find the value of $f(-4)$. What point must lie on this quadratic graph based on this calculation?

$$f(-4) = \underline{\hspace{2cm}} \quad \text{Point: } \underline{\hspace{2cm}}$$

If $y = 2x^2 + 16x + 31$, then find the value of $f(-2)$. What point must lie on this quadratic graph based on this calculation?

$$f(-2) = \underline{\hspace{2cm}} \quad \text{Point: } \underline{\hspace{2cm}}$$

Homework ~ Tuesday 12/10

The quadratic function $y = 9 - x^2 + 4x$ written in standard form would be:

- (1) $y = -x^2 + 4x + 9$ (3) $y = x^2 - 4x + 9$
 (2) $y = x^2 - 9x + 4$ (4) $y = -x^2 - 4x + 9$

Which of the following would be the leading coefficient of $f(x) = 6 - x + 7x^2$

- (1) -1 (3) 7
 (2) 6 (4) -7

Which of the following points lies on the graph of $y = x^2 - 5$?

- (1) (3, -2) (3) (5, 0)
 (2) (-2, -1) (4) (-1, -6)

A quadratic function is partially given in the table below. Which of the following are the coordinates of its turning point?

- (1) (0, 6) (3) (3, 15)
 (2) (10, 2) (4) (7, -1)

x	-2	-1	0	1	2	3
y	10	7	6	7	10	15

Homework ~ Wednesday 12/11**A)**

Consider the function $f(x) = x^2 + 2x - 3$.

Use your graphing calculator to complete the table. If you don't have one, complete it using paper and pencil.

x					
y					

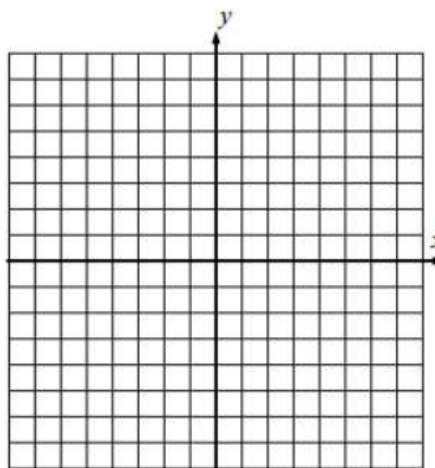
C)

State the axis of symmetry ($x = \#$): _____

State the vertex (x, y): _____

State the range (y -values): _____

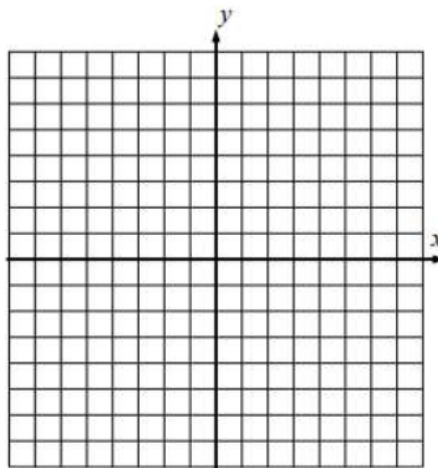
B) Use the table from part A to accurately graph the function.



Homework ~ Thursday 12/12**A)** Consider the function $f(x) = 2x^2 - 3x + 1$

Use your graphing calculator to complete the table. If you don't have one, complete it using paper and pencil.

x					
y					

B) Use the table from part A to accurately graph the function.**C)**

State the axis of symmetry ($x = \#$): _____

State the vertex (x, y): _____

State the range: _____

Homework ~ Thursday 12/13**B)** Consider the function $f(x) = -1/2x^2 - 4x$

Use your graphing calculator to complete the table. If you don't have one, complete it using paper and pencil.

x					
y					

E)

State the axis of symmetry ($x = \#$): _____

State the vertex (x, y): _____

State the range: _____

D) Use the table from part A to accurately graph the function.