Today's Plan:

Learning Target (standard): I will describe quadratic equations as functions. I will find the vertex of a quadratic function.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

NAME _____   #118

BELL RINGER

$0:00:00$

1.) Solve $5(2 - x) = 3x + 6$.

$10 - 5x = 3x + 6$

$10 - 8x = 6$

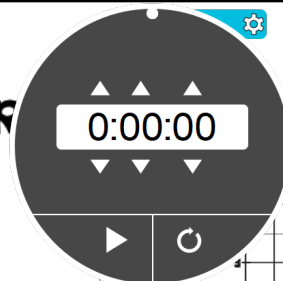$\dfrac{-8x}{-8} = \dfrac{-4}{-8}$

$x = \dfrac{1}{2}$

2.) Graph $y = \dfrac{2}{3}x - 1$.

(using slope-intercept method)

$m = \dfrac{2}{3}$
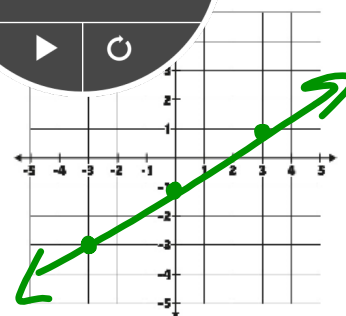
$I_y: (0, -1)$

3.) Reduce $-\dfrac{6}{3}$. $= -2$

X	Y
-2	4
3	5
2	4

Function? Why?

Function - every x-value has only one y-value

X	Y
2	3
2	-2
4	3

Function? Why?

No - the x-value of 2 has 2 different y-values

X	Y
1	3
3	-1
0	4

Fill in the blanks to make a function.

X	Y
0	3
1	-2
0	3

Fill in the blanks to make a function.

X	Y
-2	4
-1	0
2	1
3	5

Fill in the blanks to make a non-function.

X	Y
3	4
-1	0
2	4
3	5

Quadratic Equation in Two Variables:

$$f(x) = ax^2 + bx + c$$

"parabolas"

↑ axis of symmetry

AOS

vertex $a(-)$

→ maximum

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

↑ opens down

AOS

$a(+)$

vertex

→ minimum

$$y = 2x^2 + x - 1$$
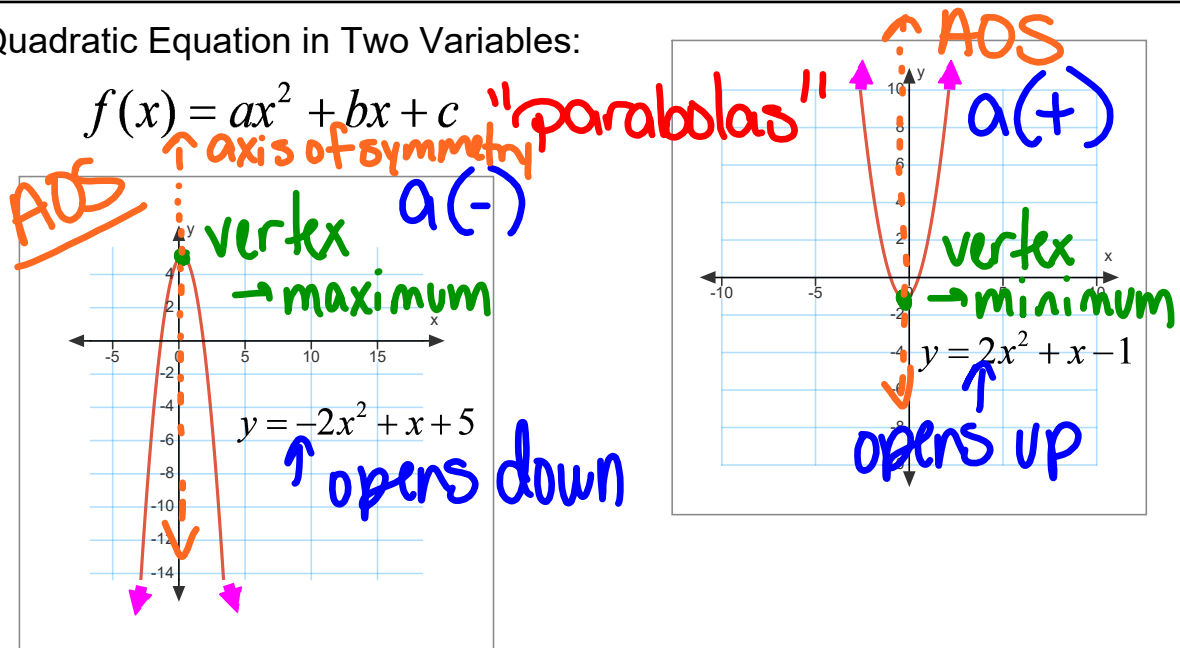
↑ opens up

Quadratic Equations:

1) standard form

$$f(x) = ax^2 + bx + c$$

$a(+)$ opens up

2) vertex form

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

$a(-)$ opens down

Quadratic Equations: x

opposite

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

vertex: (h, k) same

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

1) opens down → maximum

2) vertex: $(4, 5)$

Tell which direction the parabola opens. Find the vertex.

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

1) opens: up → minimum

2) vertex: $(-3, -2)$

Quadratic Equations:

$$f(x) = ax^2 + bx + c$$

$$x = -\frac{b}{2a}$$ * plug in x to get y

vertex: (x, y)

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

---

1) opens: up → minimum

2) vertex: (-2, -7)

$$x = -\frac{b}{2a} = \frac{-4}{2(1)} = \frac{-4}{2} = -2$$

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

$$= 4 - 8 - 3$$

$$f(-2) = -7$$

* this is the y-value
when x = -2

Tell which direction the parabola opens. Find the vertex.

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

1) opens: up → minimum

2) vertex: $(-1, -2)$

$$x = -\frac{b}{2a} = \frac{-2}{2(1)} = \frac{-2}{2} = -1$$

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

Assignment:

Vertex of a Quadratic

#1-12

* tell the direction & find the vertex *