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 _____   #117

BELL RINGER

1.) Find the slope and y-intercept of the graph of the linear equation $y = 3x - 2$. $m = 3$ $I_y: (0, -2)$

Slope of a parallel line? Slope of a perpendicular line?

$m_{\parallel} = 3$ $m_{\perp} = -\frac{1}{3}$

2.) Solve $\frac{1}{6}y = -8$.

$y = -48$

0:00:00

3.) Find the value of x so that the function $h(x) = 4x + 15$ has the value $h(x) = 7$.

$$7 = 4x + 15$$
$$-8 = 4x$$
$$\frac{-8}{4} = \frac{4x}{4}$$
$$x = -2$$

Solve by completing the square:

$$h^2 + \boxed{4}h = 5$$

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

$$h^2 + 4h + 4 = 5 + 4$$

$$\sqrt{(h+2)^2} \overset{\pm}{=} \sqrt{9}$$

$$h + 2 = 3, -3$$

$$h + 2 = 3 \qquad h + 2 = -3$$

$$\boxed{h = 1, -5}$$

Solve by factoring:

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

$$15$$
$$5 \quad -3 = 2$$

$$x^2 + 5x - 3x - 15 = 0$$

$$x(x+5) - 3(x+5) = 0$$

$$(x+5)(x-3) = 0$$

$$x + 5 = 0 \qquad x - 3 = 0$$

$$x = -5 \qquad x = 3$$

$$\boxed{x = -5, 3}$$

Solve by completing the square:

$$\frac{2h^2}{2} - \frac{8h}{2} = \frac{24}{2} \qquad \frac{4}{2} = 2^2 = 4$$

$$h^2 - \boxed{4}h + 4 = 12 + 4$$

$$\sqrt{(h-2)^2} \overset{\pm}{=} \sqrt{16}$$

$$h - 2 = 4, -4$$

$$\boxed{h = 6, -2}$$

Solve by completing the square:

$$\frac{24}{2} = 12^2 = 144$$

$$m^2 - 24m + 44 = 0$$

$$m^2 - \boxed{24}m + 144 = -44 + 144$$

$$\sqrt{(m-12)^2} \overset{\pm}{=} \sqrt{100}$$

$$m - 12 = 10, -10$$

$$m - 12 = 10 \qquad m - 12 = -10$$

$$\boxed{m = 22, 2}$$

Solve by completing the square:

$$\frac{2}{2} = 1^2 = 1$$

$$\frac{3f^2}{3} - \frac{6f}{3} = \frac{9}{3}$$

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

$$(f-1)^2 = \pm\sqrt{4}$$

$$f - 1 = 2, -2$$

$$f - 1 = 2 \qquad f - 1 = -2$$

$$f = 3, -1$$

Solve by factoring:

$$2x^2 - 5x - 12 = 0$$

$$24$$

$$3 - 8 = -5$$

$$2x^2 + 3x - 8x - 12 = 0$$

$$x(2x+3) - 4(2x+3) = 0$$

$$(2x+3)(x-4) = 0$$

$$2x + 3 = 0 \qquad x - 4 = 0$$

$$2x = -3 \qquad x = 4$$

$$x = -\frac{3}{2}$$

$$x = -\frac{3}{2}, 4$$

Objective - To recognize whether a relation is a function and to use function notation

Relation - Any set of ordered pairs

Function - A type of relation where there is exactly one output for every input. ==For every x there is exactly one y.==
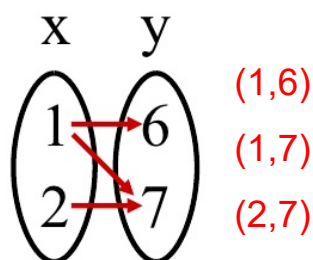
x   y
1 → 6
2 → 7

(1,6)
(1,7)
(2,7)

Not a Function

The x-value of 1 has more than one y-value.

x   y
1 → 6
2 → 7

(1,6)
(2,6)
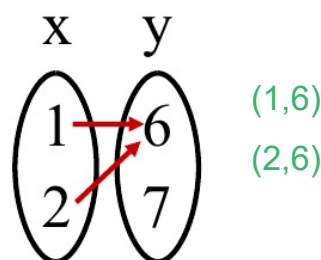
Function

Every x-value has only one y-value.

Functions:

- Although a function can be described in terms of ordered pairs, most of the time they are described by an equation

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

- $f(x)$ is the symbol for the number that is paired with x and it is read " f of x"

- In terms of ordered pairs, this is written as $(x, f(x))$

- It is important to remember that $f(x)$ does not mean *f* times *x*. The letter *f* stands for the function, and $f(x)$ is the number paired with *x*.

- In a function, no *x*-value can have different *y*-values (*x*-values cannot be repeated with different *y*-values)

X	Y
1	3
3	4
4	5

Function? Why?

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

X	Y
-1	4
-1	3
2	5

Function? Why?

Not a Function - the x-value of -1 has more than one y-value.

Function

X	Y
1	2
2	4
3	6
4	8
5	10
6	12

every x-value has only one y-value

Not a Function

X	Y
1	2
2	4
1	5
3	8
4	4
5	10

the x-value of 1 has more than one y-value

Function

X	-3	0	3	8	-10
Y	6	8	20	4	8

every x-value has only one y-value

Not a Function

X	-2	0	-2	7	-8
Y	6	8	20	4	8

the x-value of -2 has more than one y-value

Function

10 ⟶ 2
3 ⟶ 3
4 ⟶ 4
7 ⟶ 8
5

every x-value has only one y-value

Not a Function

10 ⟶ 2
3 ⟶ 3
5 ⟶ 4
7 ⟶ 7
2 ⟶ 5
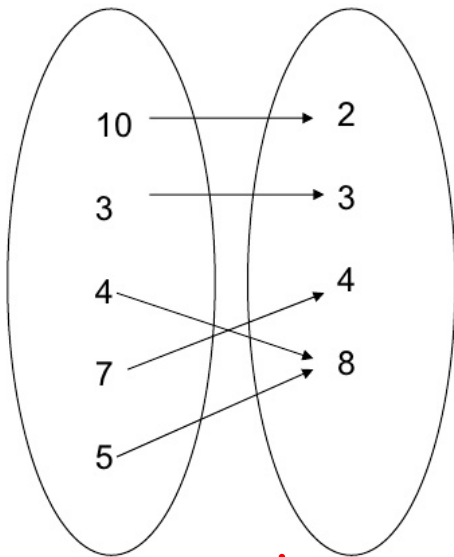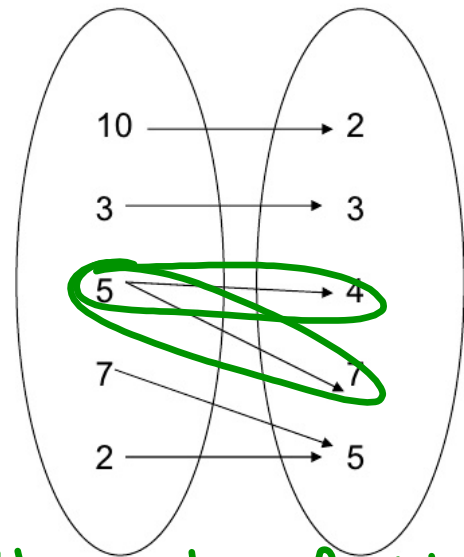
the x-value of 5 has more than one y-value
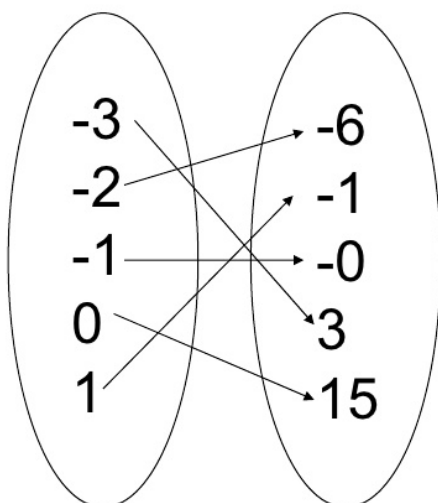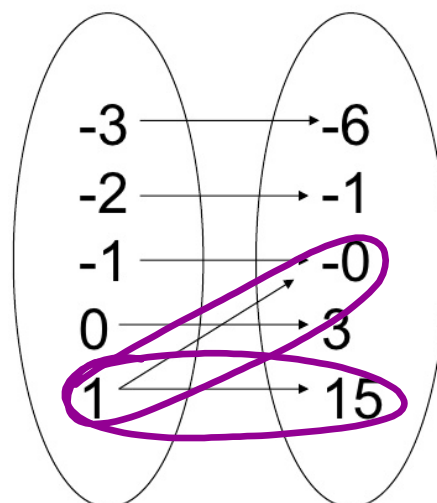
Function

-3
-2
-1
0
1

-6
-1
-0
3
15

every x-value has only one y-value

Not a Function

-3 ⟶ -6
-2 ⟶ -1
-1 ⟶ -0
0 ⟶ 3
1 ⟶ 15

the x-value of 1 has more than one y-value
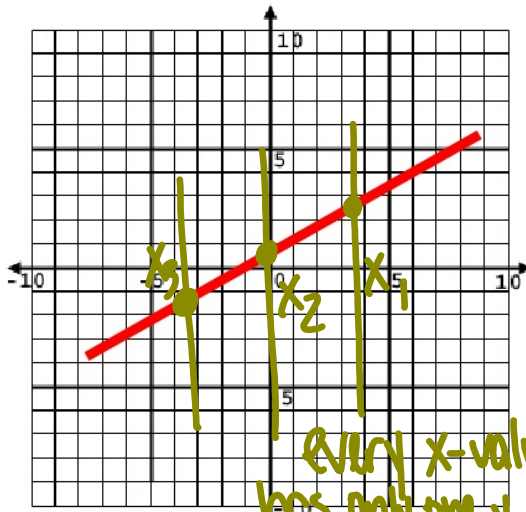
Function

Not a Function

every x-value has only one y-value
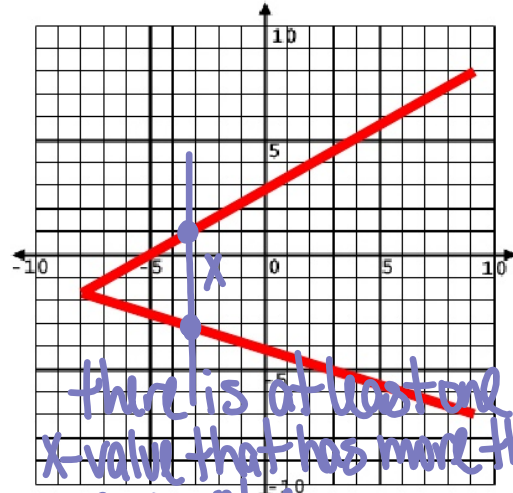
there is at least one x-value that has more than one y-value

Vertical Line Test - every vertical line will only pass thru a function at most one time
- It only takes ONE vertical line to pass thru more than once to fail the vertical line test
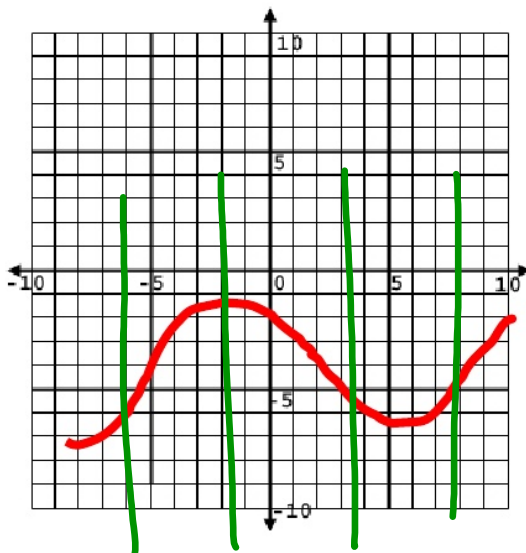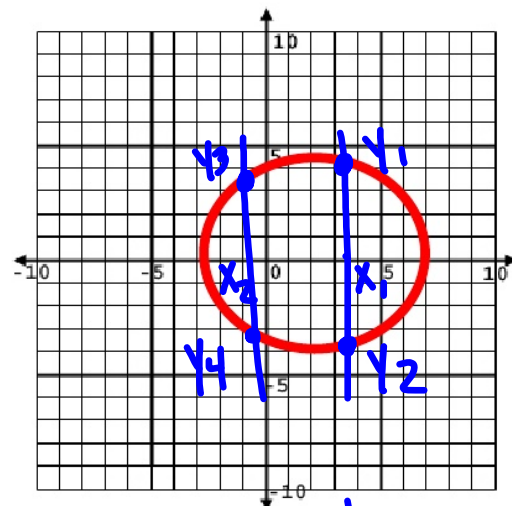
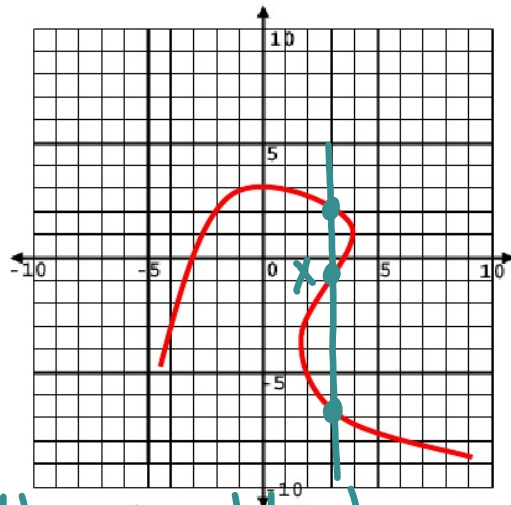## Function

Not a Function

every x-value has only one y-value

there is at least one x-value that has more than one y-value
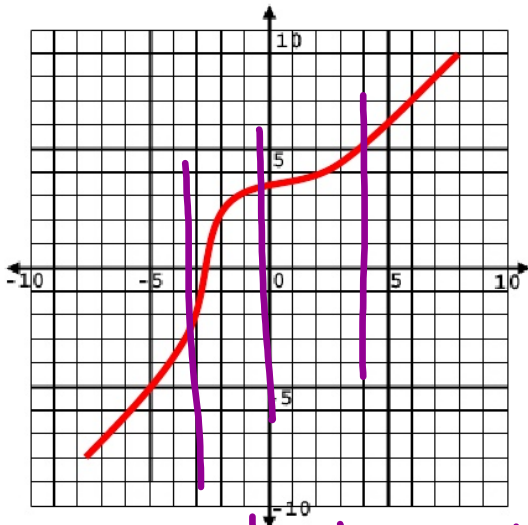
Function

Not a Function

every x-value has only one y-value

there is at least one x-value that has more than one y-value

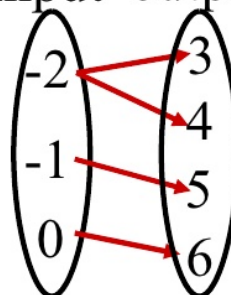Tell whether the relation below is a function.

1) input output

0
1
2
3

5
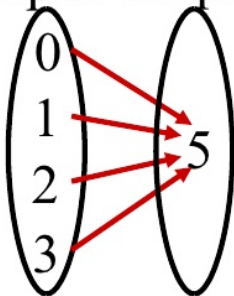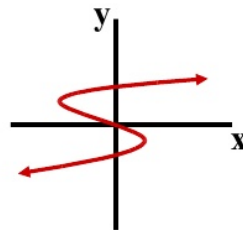
Function

2)

x	y
-3	-1
-3	0
-3	1
-3	2

Not a Function

3)
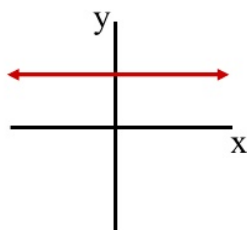
y

x

Not a Function

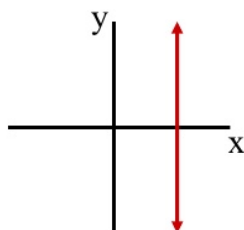4) input output

-2
-1
0

3
4
5
6
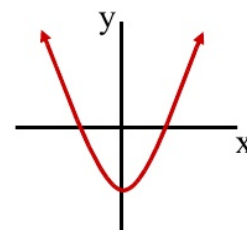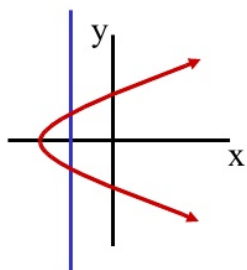
Not a Function
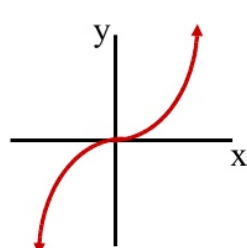
Vertical Line Test - Functions
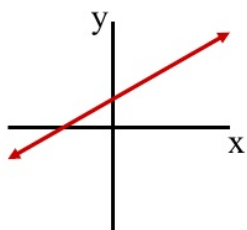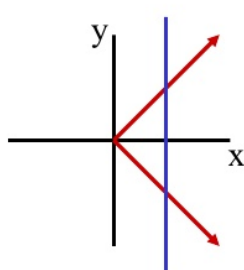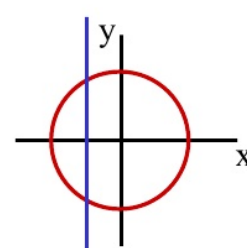
Function   Function   Not a Function   Function

Not a Function   Function   Not a Function   Not a Function

X	Y
2	4
3	5
2	4

Function?

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

X	Y
-1	3
3	-2
4	3

Function?

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

Assignment: * This assignment is worth 10 points! *

Function or Not Packet

* Tell why or why not on each problem. If it is not, show the ordered pairs that cause the problem. *