

Vocab- write this in your binder

- **A function is a rule. Each input must only have one output.**
- **Each x value can only be paired with one y value**

Function?

x	y
3	6
5	10
5	12
8	14
12	18

No; the input "5" has more than one output.

Function?

x	y
-8	16
10	-20
1	-2
4	-8
1	-2

Yes; there is a repeated input, but the output is the same

Function?

x	y
1	5
1	6
2	7
2	8
3	9

No; the inputs "1" and "2" have more than one output.

Function?

x	y
1	24
2	9
3	-6
4	-21
5	-36

Yes; each input has only one output.

Function?

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

Yes; each input has only one output. (You can have the same output for multiple inputs!)

Function?

(2, 8); (-5, 9); (7, 9); (2, -4), (7, 4)

No; the input "2" has more than one output.

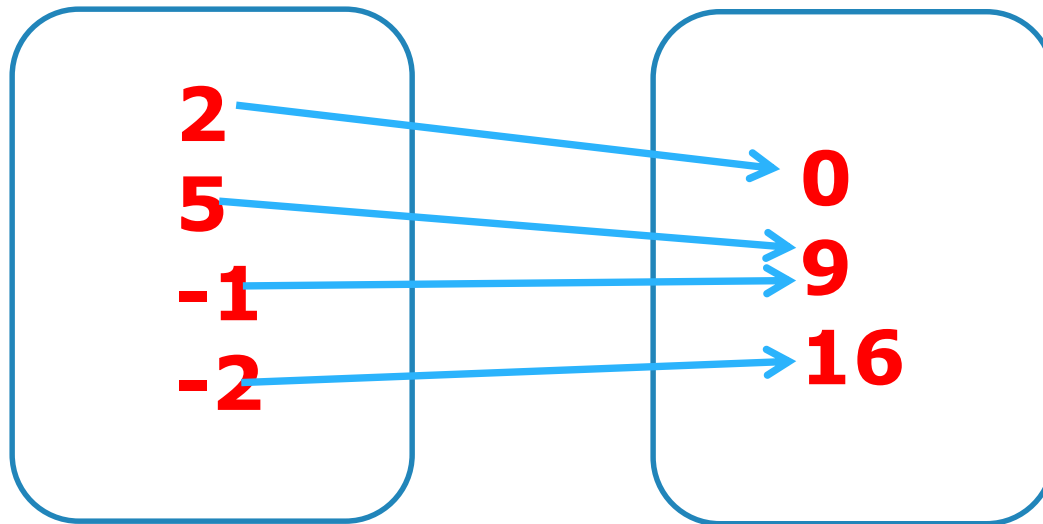
Function?

**(1, 5); (8, 19); (4, 11); (-8, -13),
(1, 5)**

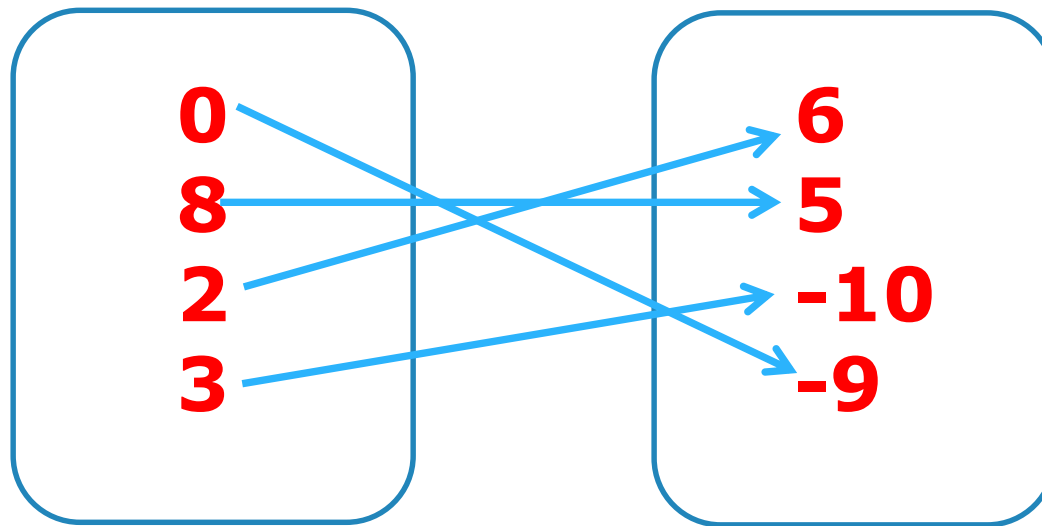
**Yes, each input has
only 1 output.**

□ Mapping Diagram:

- Express the relation $(2,0)$, $(5, 9)$, $(-1, 9)$, $(-2, 16)$ as a mapping diagram.

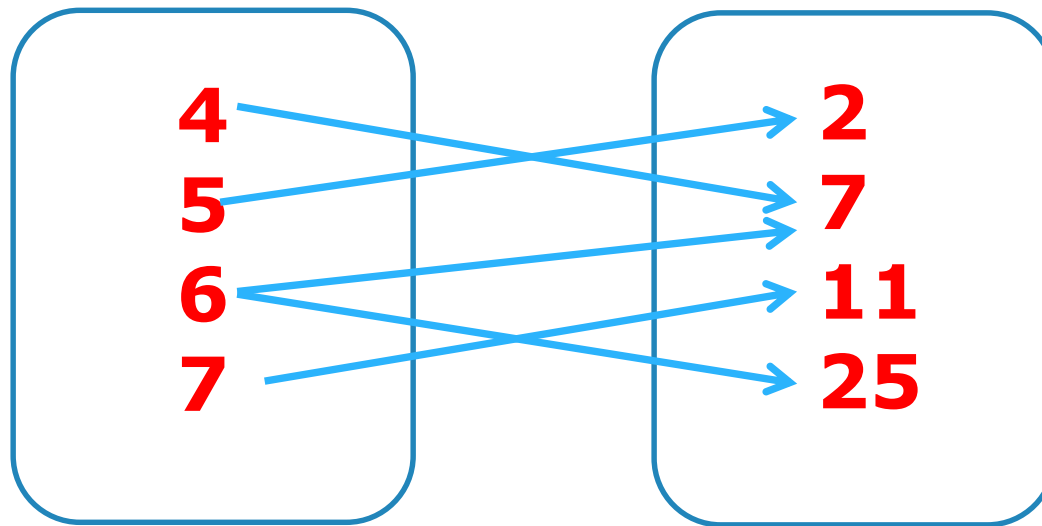


Function?



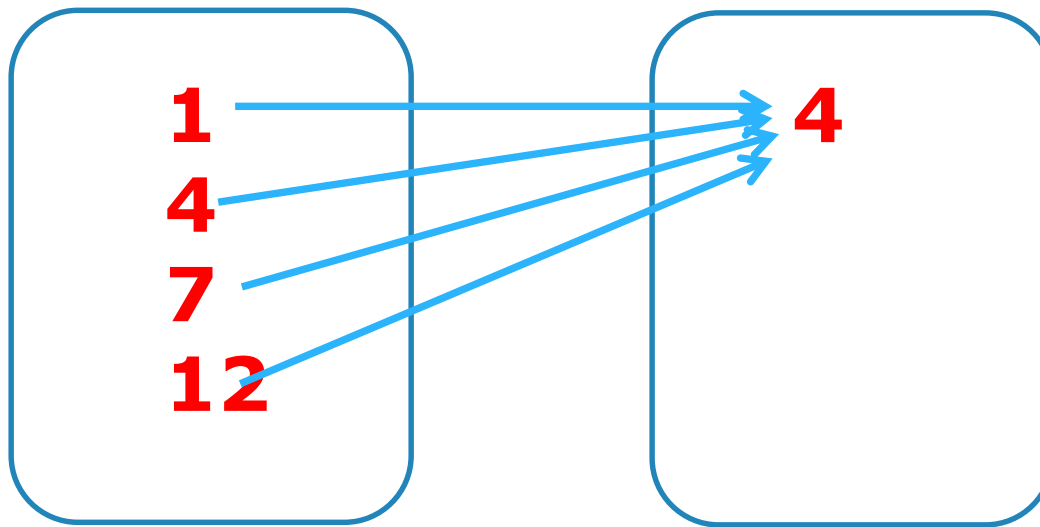
Yes, each input has only 1 output.

Function?



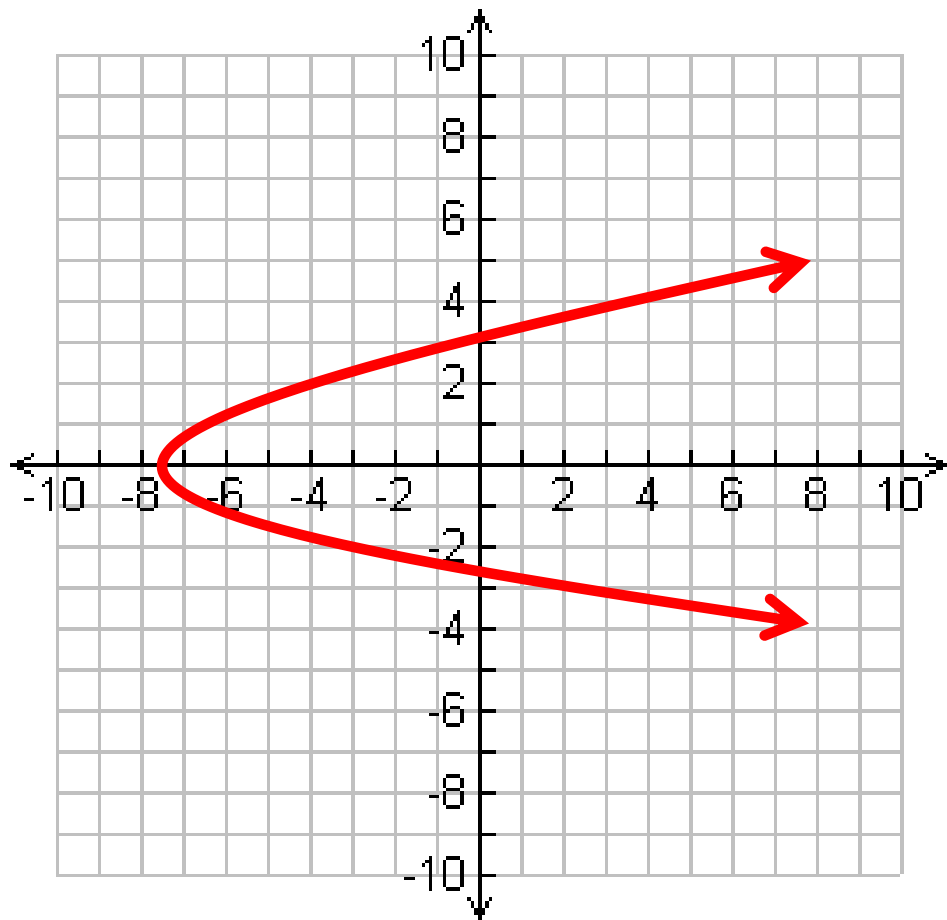
No; the input "6" has more than one output.

Function?



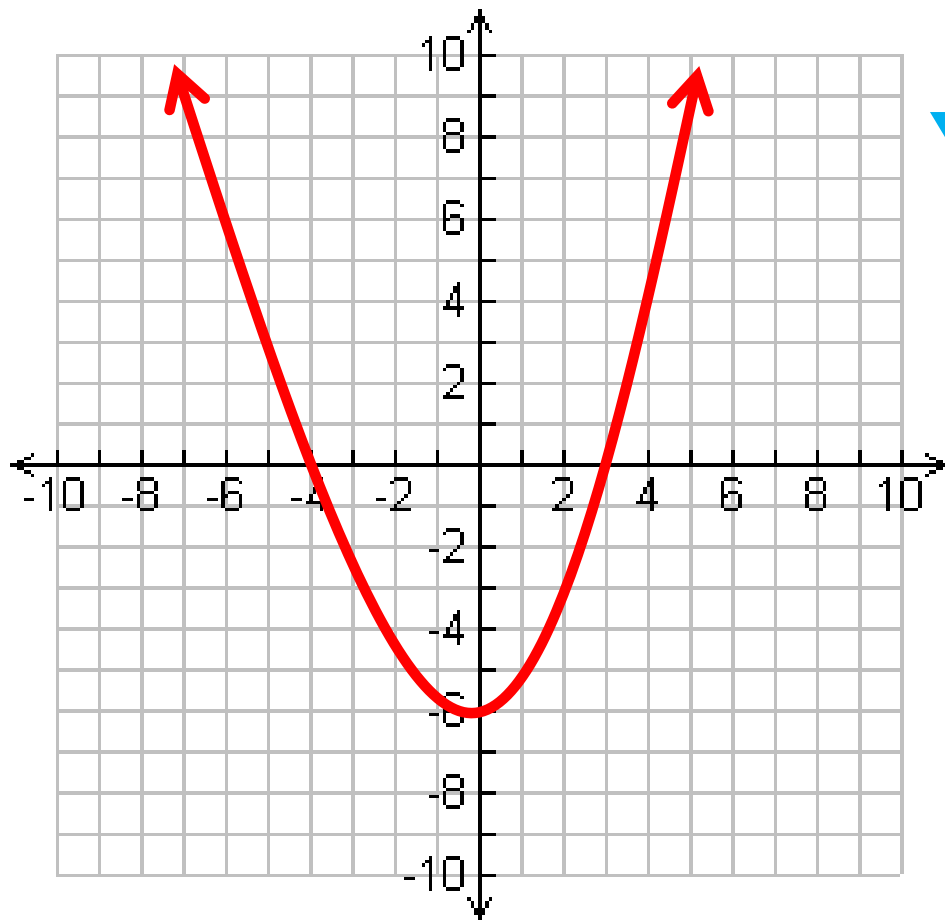
Yes, each input has only 1 output.

Function? (COPY THIS ONE FOR YOUR NOTES)



**No; most
x-values
have two
different
y-values**

Function? (COPY THIS ONE FOR YOUR NOTES)



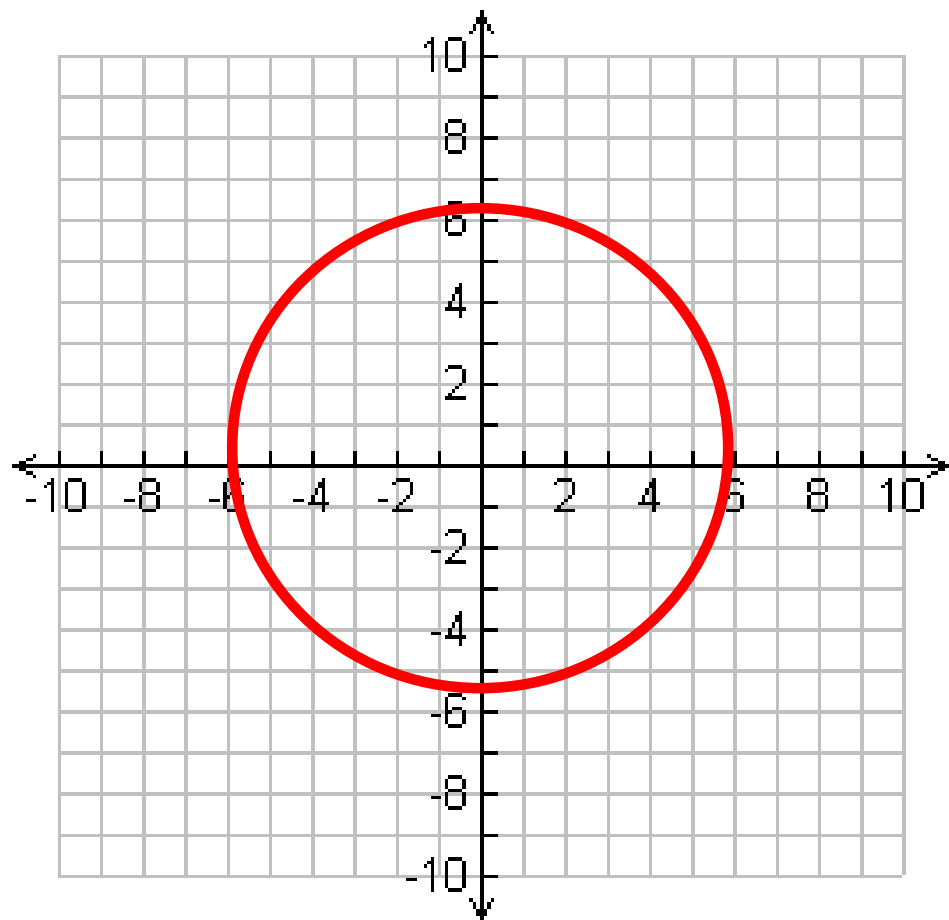
Yes

Rules for graphs of functions

□ ON A GRAPH:

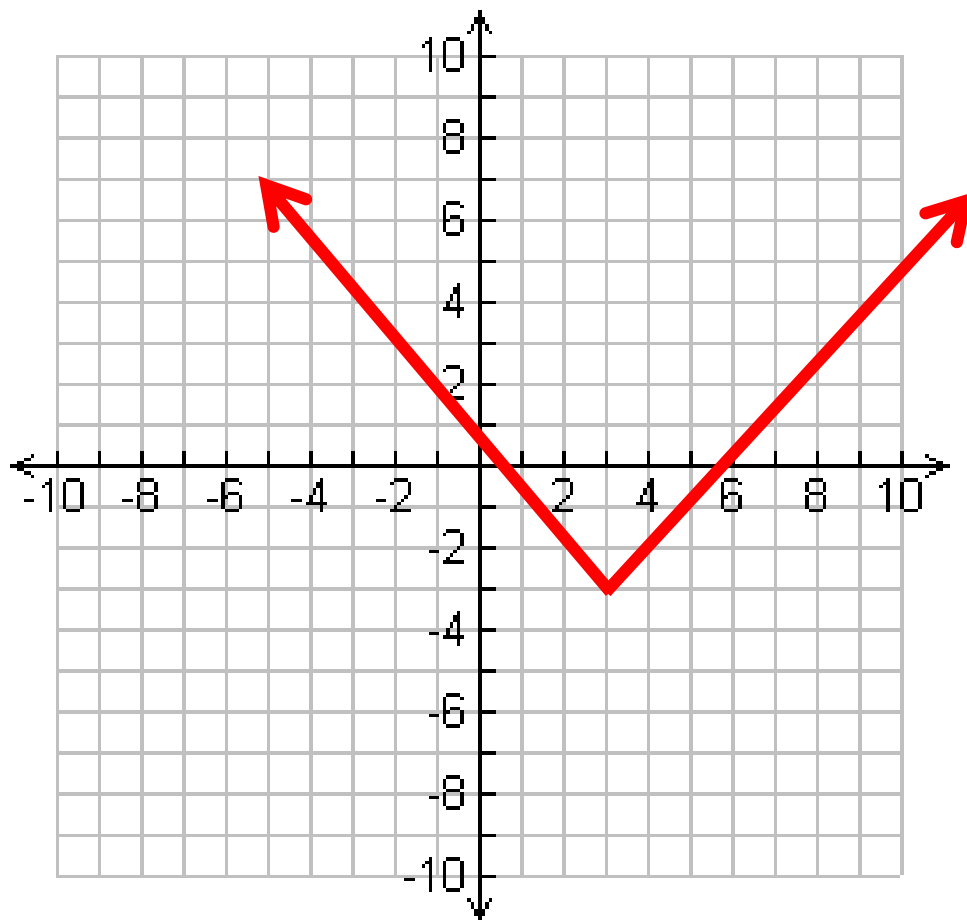
- **The x-value (horizontal) is the INPUT and the y-value (vertical) is the OUTPUT.**
- **To be a function, each x-value can only have one y-value.**

Function?



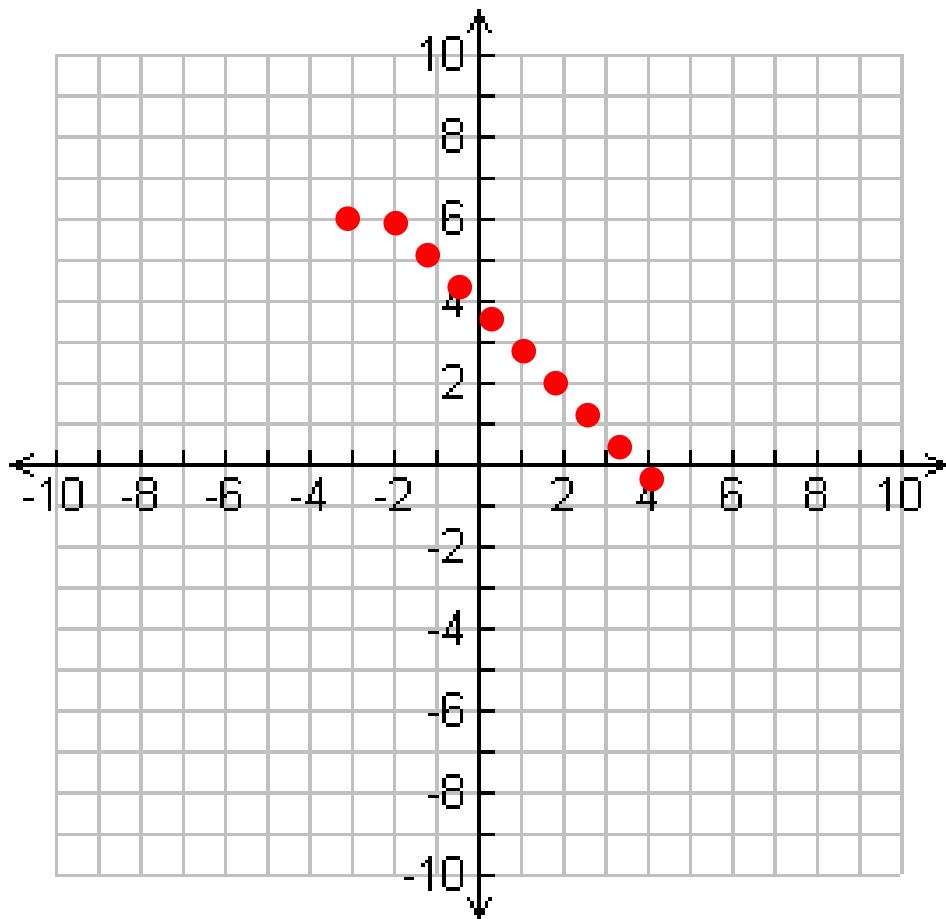
No

Function?



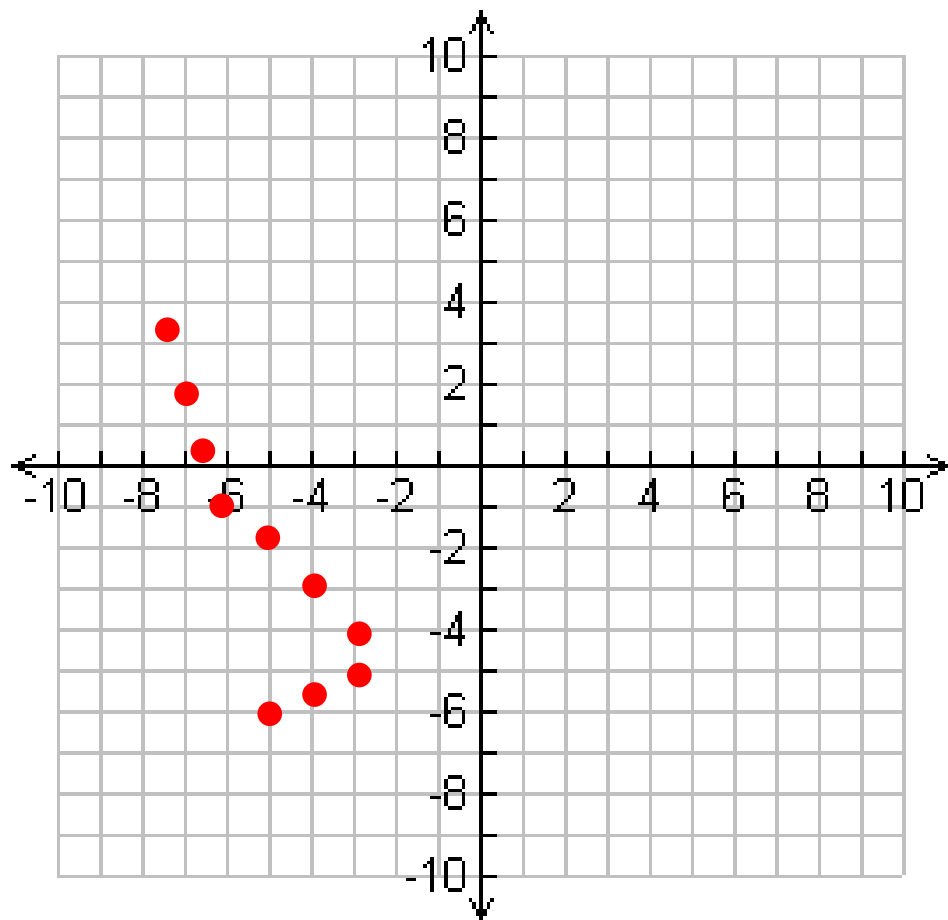
Yes

Function?



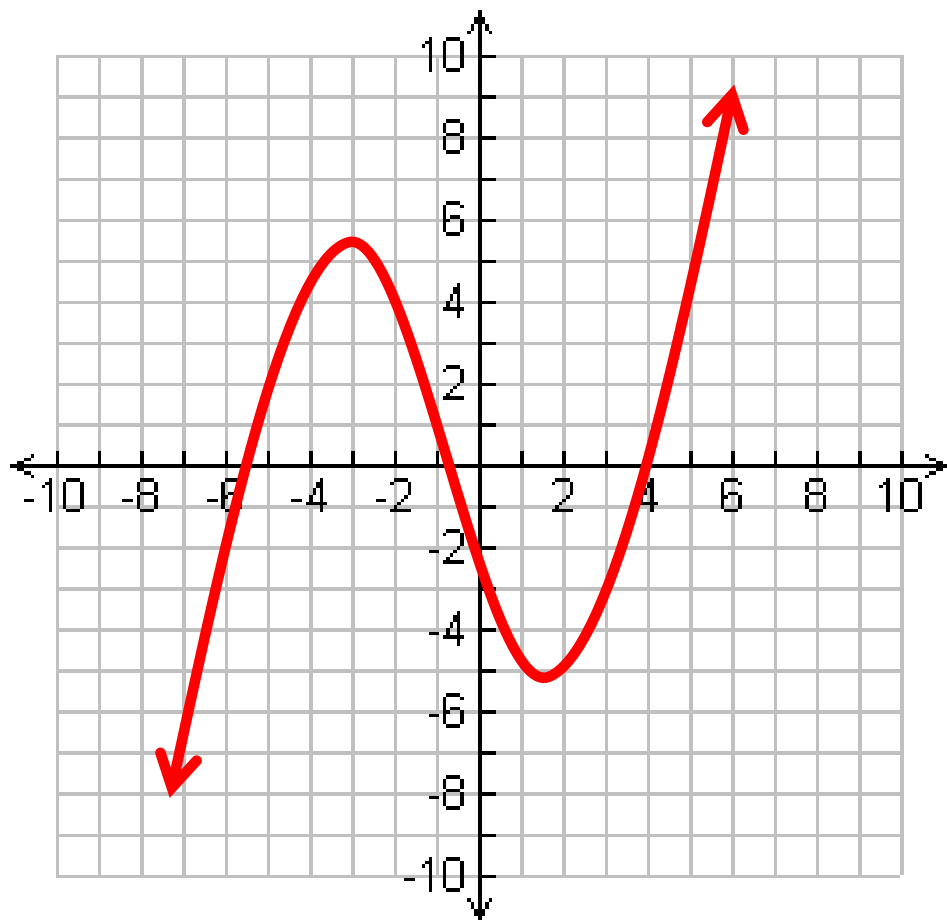
Yes

Function?



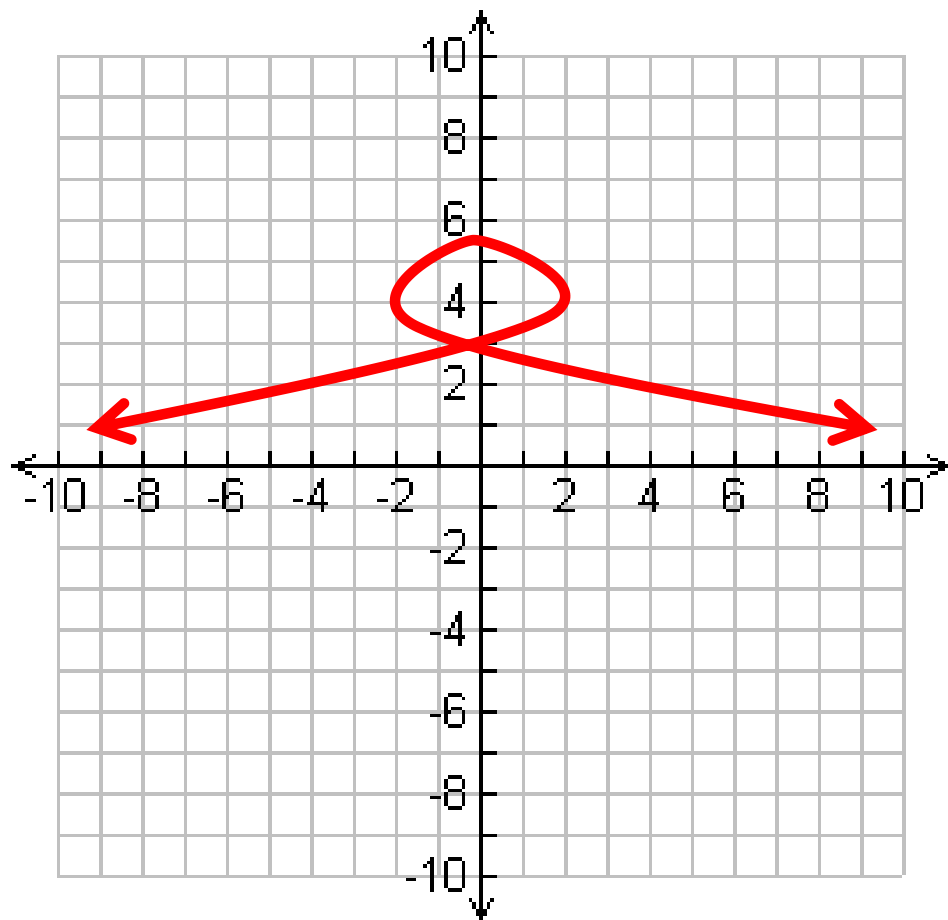
No

Function?



Yes

Function?



No

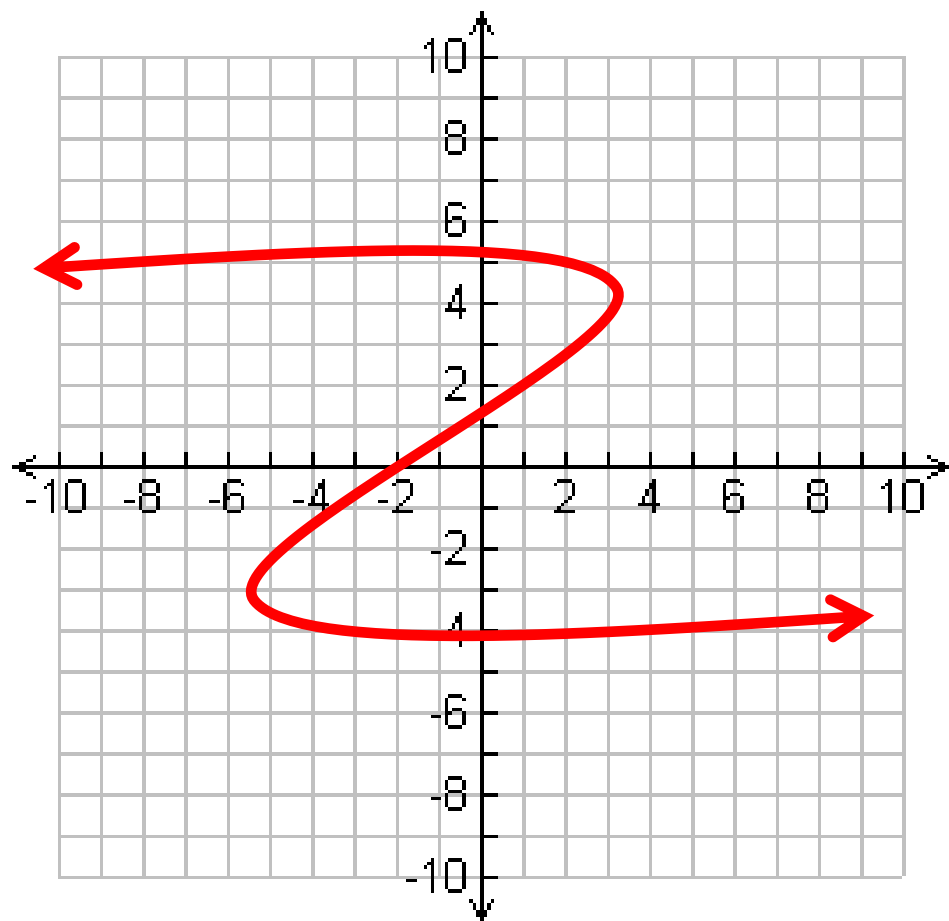
-
1. What is the main rule to be able to tell if something is a function or not?
 2. Fill in the table with values that would make it **not** be a function.

x	0	2	4	6	6
y					

3. Fill in the table with values that would make it be a function.

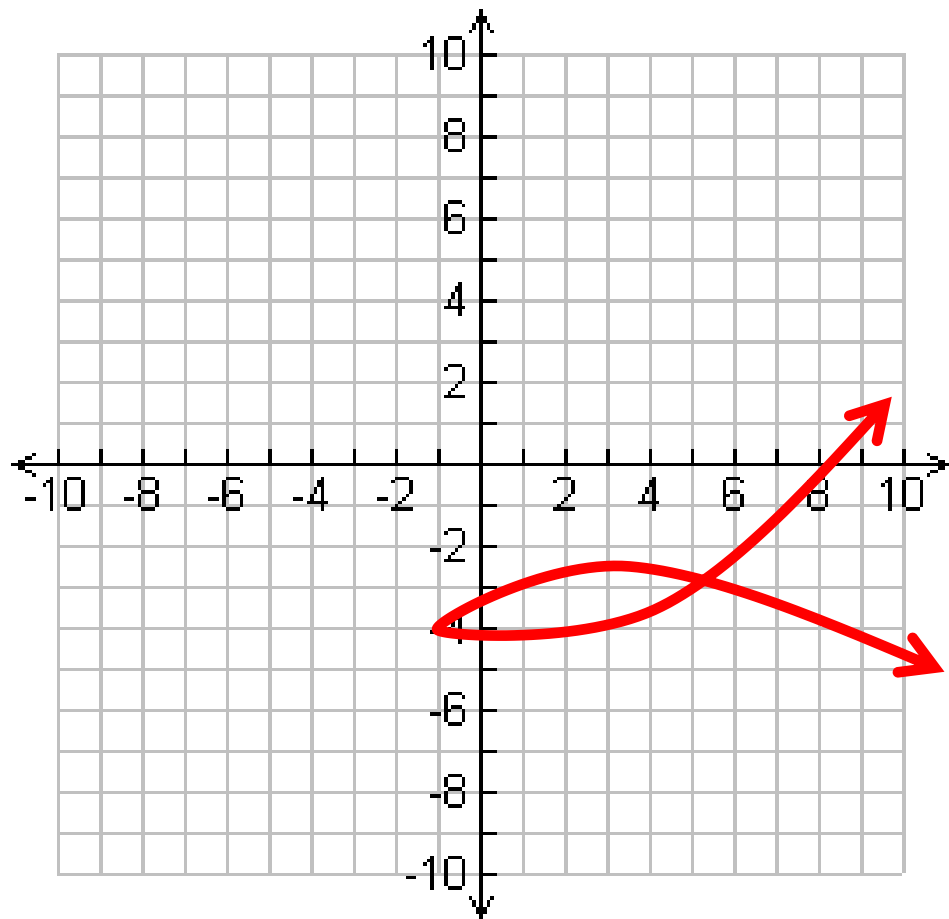
x	0	2	4	6	6
y					

Function?



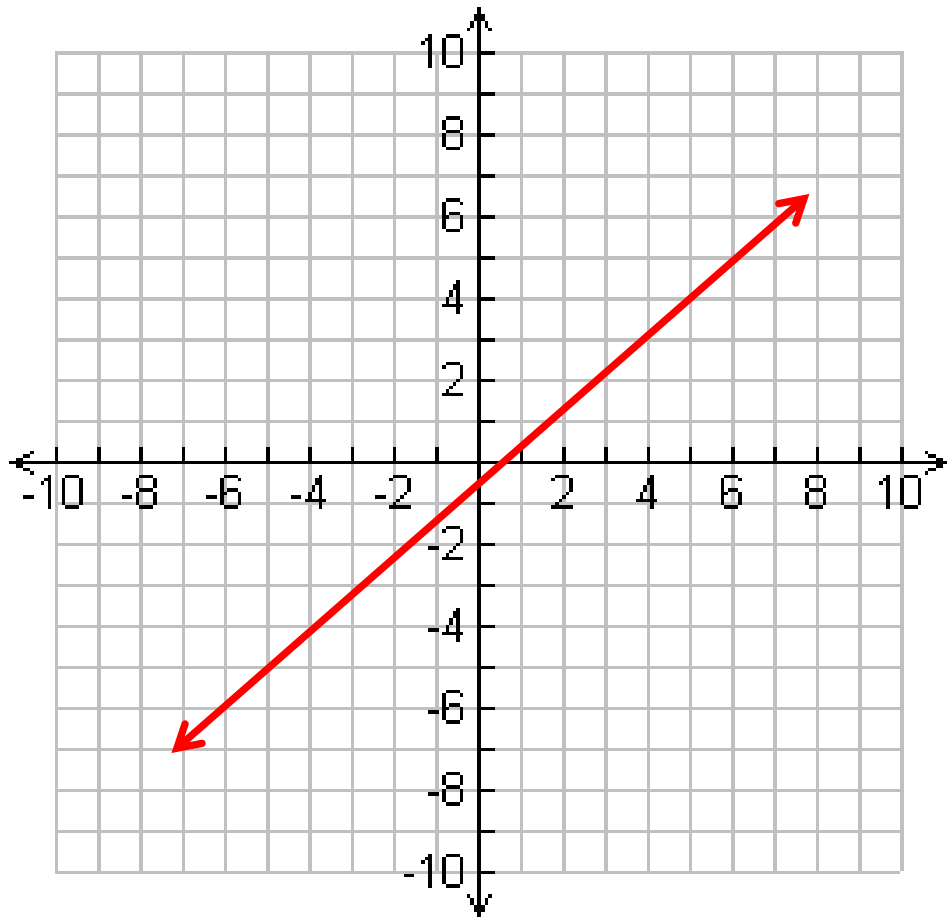
No

Function?



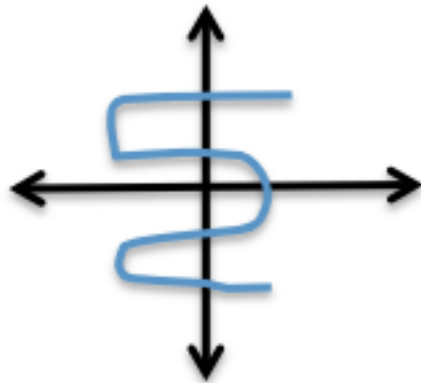
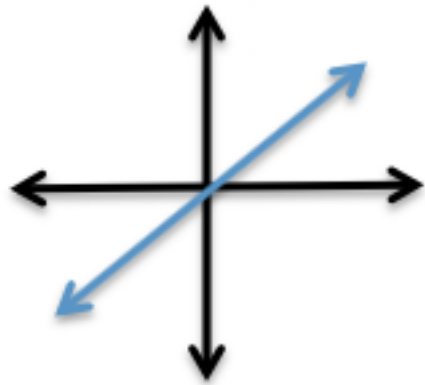
No

Function?

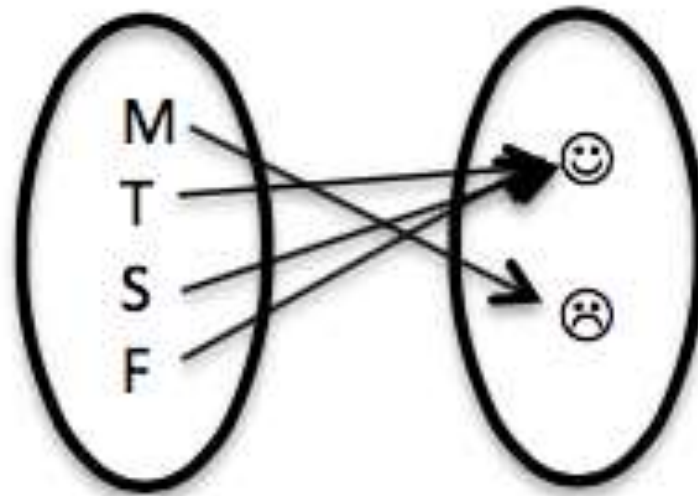
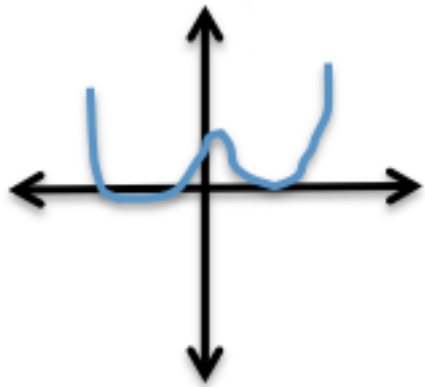


Yes

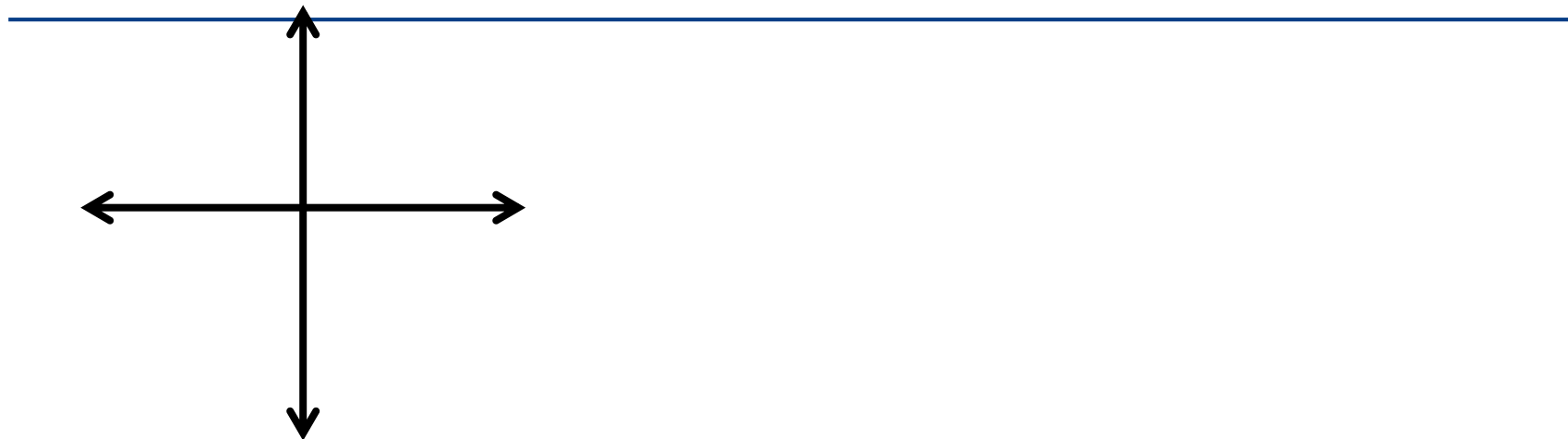
Which are functions?



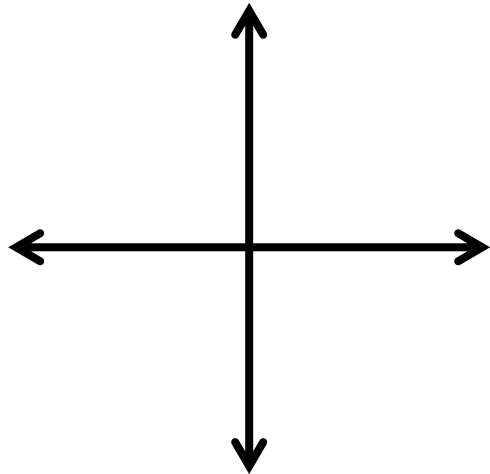
x	1	2	3	4
y	2	2	2	2



Add **five** points to the graph so that it would **not** be a function.



Add **five** points to the graph so that it **would** be a function.



Would this be a function?

- ❑ Input = student in this class
- ❑ Output = desk label of the student's assigned seat

Yes, each input has only 1 output.

WITH YOUR GROUP:

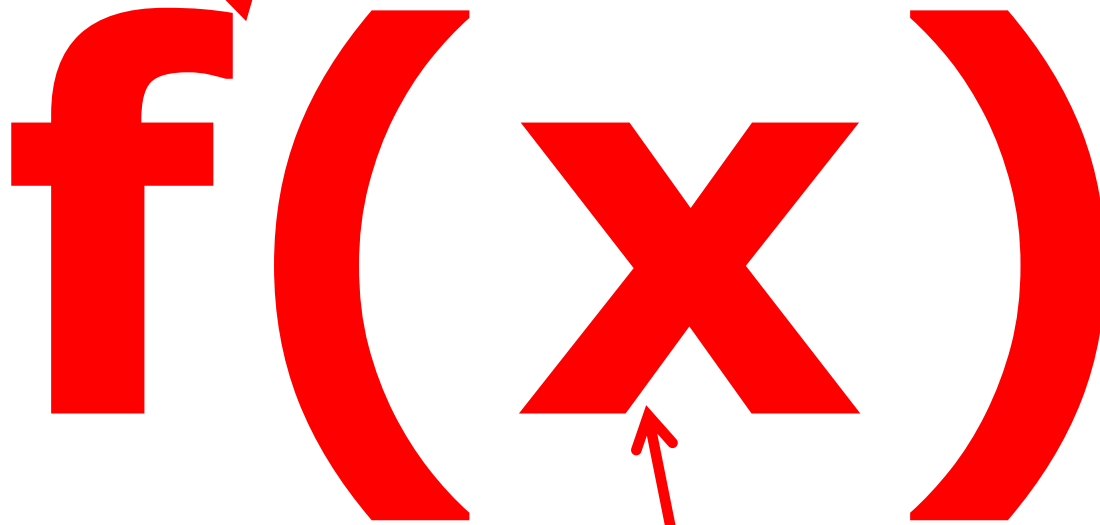
- **Decide whether each of the relationships are functions. EACH PERSON should be able to explain each one, so discuss well!!!**
-

1. **Input = Facebook user, Output = password**
2. **Input = student, Output = the student's hair color**
3. **Input = student in our class, Output = planet he/she lives on**
4. **Input = state, Output = # of letters in the state's name**
5. **Input = month, Output = # of days in the month**
6. **Input = # of days in the month, Output = month**
7. **Input = date, Output = temperature outside**
8. **Input = password, Output = Facebook user**
9. **Input = any integer, Output = double that integer**

1, 2, 3, 4, 5, 9 are functions

Function Notation

This is the name of the
function



The diagram shows the function notation $f(x)$ in large, bold, red letters. A red arrow points from the text "This is the name of the function" to the letter 'f'. Another red arrow points from the text "This is the variable" to the letter 'x' inside the parentheses.

This is the variable

- Read: “f of x”

IMPORTANT

- **$f(x)$ DOES NOT MEAN “f times x”**
- **$f(5)$ means “What do you get when you plug “5” into the function “f”?”**

Evaluating Functions

□ Use the following functions:

$$a(x) = 4x - 2$$

$$c(x) = x^2 + 1$$

$$b(x) = -9 + x$$

$$a(3) = 4(3) - 2$$

$$a(3) = 12 - 2$$

$$a(3) = 10$$

1) What is $a(3)$?

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

$$c(-3) = 9 + 1$$

$$c(-3) = 10$$

2) What is $c(-3)$?

$$b(100) = -9 + 100$$

$$b(100) = 91$$

3) What is $b(100)$?

b(100) = 91

MEANS:

“when I input 100 into the function “b” I get 91 as my output”

**What does $c(-3) = 10$
mean?**

MEANS:

**“when I input -3 into the function
“c” I get 10 as my output”**

Evaluate the functions:

$$\underline{r(x) = -2x + 8}$$

$$s(x) = 3x^2$$

$$t(x) = |x - 2|$$

1. $s(5) = 75$

2. $t(5) = 3$

3. $r(-6) = 20$

4. $t(-4) = 6$

5. $s(-3) = 27$

Homework



Worksheet