Warmup 9/$\left(\frac{7+7+7+7+7}{7}\right)$

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Throwback Thursday!

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

$3x-6+5+2x=6x-x+2$

$5x-1=5x+2$

NO SOLUTION

- Solve and graph: $-2<-2x+4<6$

$-4 \quad -4 \quad -4$

$-6<-2x<2$

$-2 \quad -2 \quad -2$

$3>x>-1$ or $-1<x<3$

- Solve for y : $6y+3=2x$

$-3 \quad -3$

$\frac{6y}{6}=\frac{2x-3}{6}\frac{6}{6}$

$y=\frac{1}{3}x-\frac{1}{2}$

1. What is the main rule to be able to tell if something is a function or not? Try to write it without looking at your notes.
2. Fill in the table with values that would make it **not** be a function.

x	0	2	4	6	6
y	8	3	-4	7	18

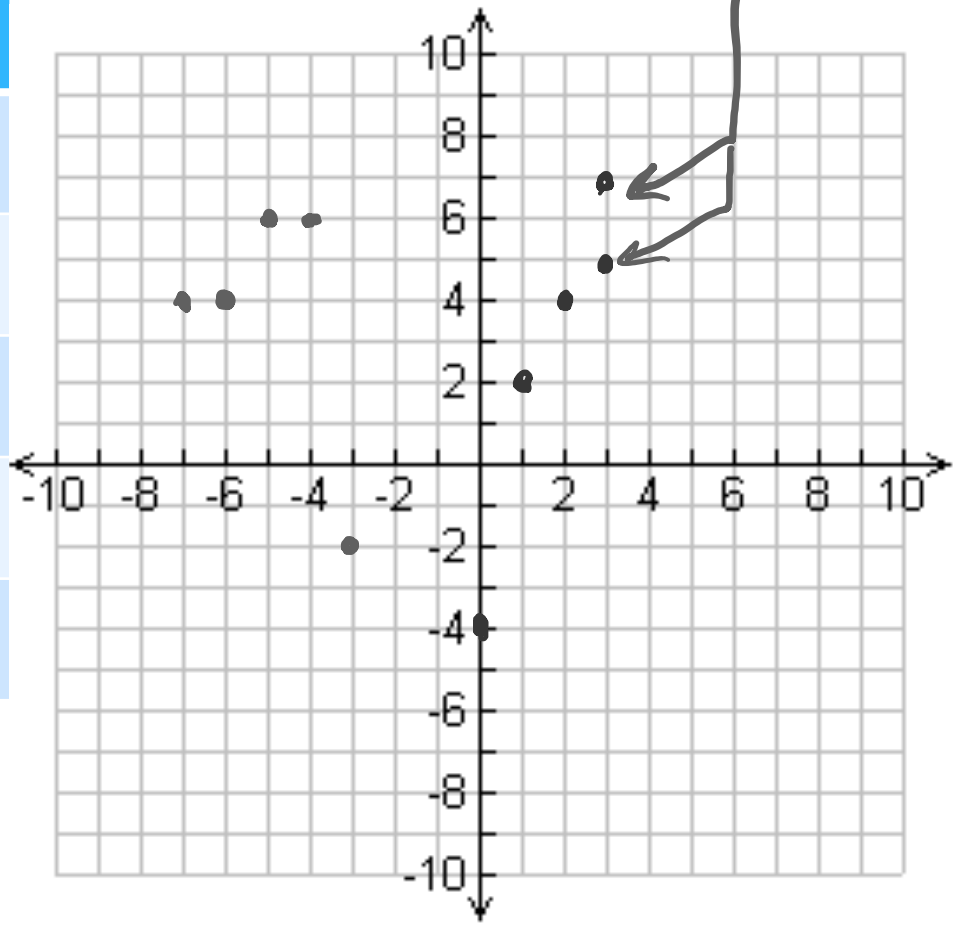
3. Fill in the table with values that would make it be a function.

x	0	2	4	6	6
y	2	18	6	3	3

NOT A FUNCTION:

NOT A FUNCTION:

x	y
0	-4
1	2
2	4
3	5
3	7



FUNCTION:

x	y
-7	4
-6	4
-5	6
-4	6
-3	-2

BY THE WAY…

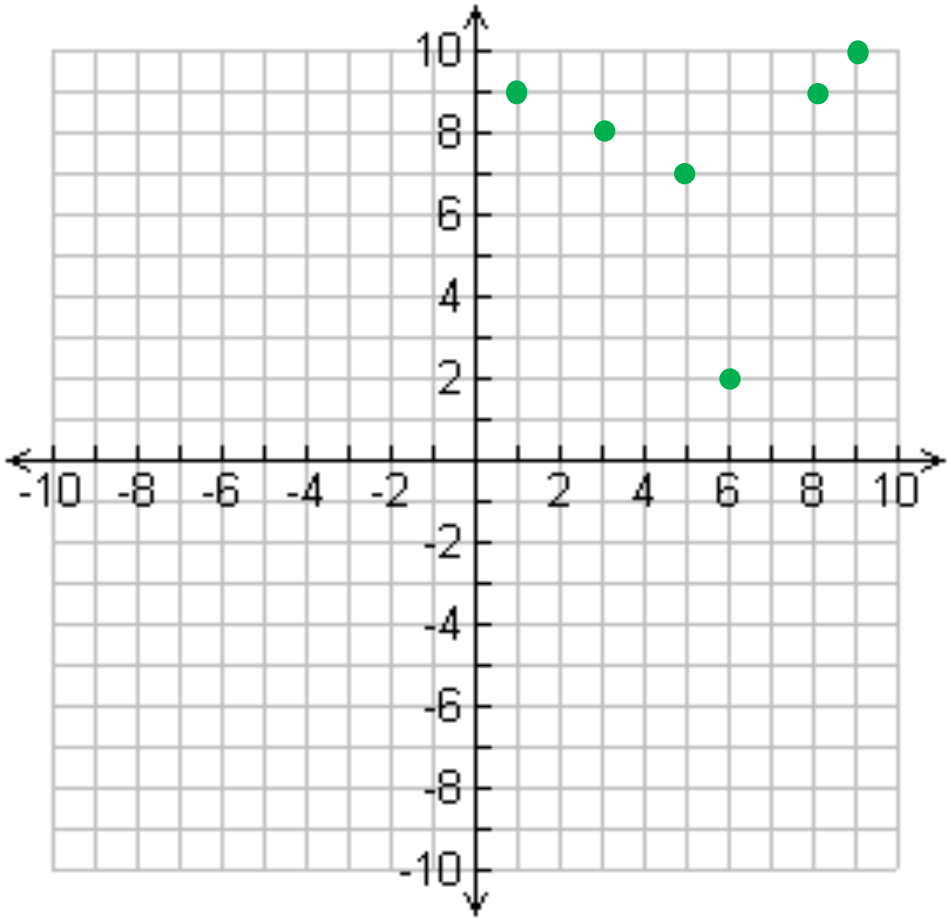
- Just because there is no obvious pattern DOES NOT MEAN there can't be a mathematical rule!
- If each input has only one output, there is ALWAYS a possible mathematical rule, even if it's really complicated.

x	y
-7	4
-6	4
-5	6
-4	6
-3	-2

- This equation happens to be

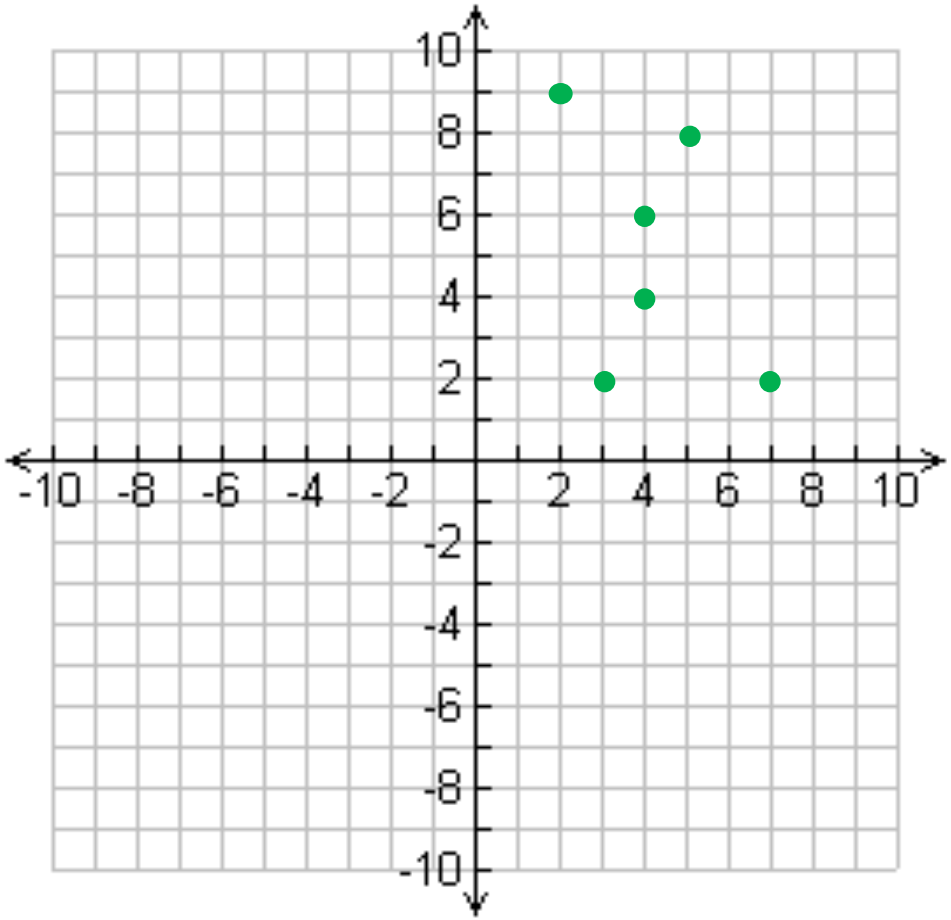
$$y = \frac{1}{12}x^4 - 2.5x^3 + \frac{311}{12}x^2 - 111.5x - 164$$

Function?



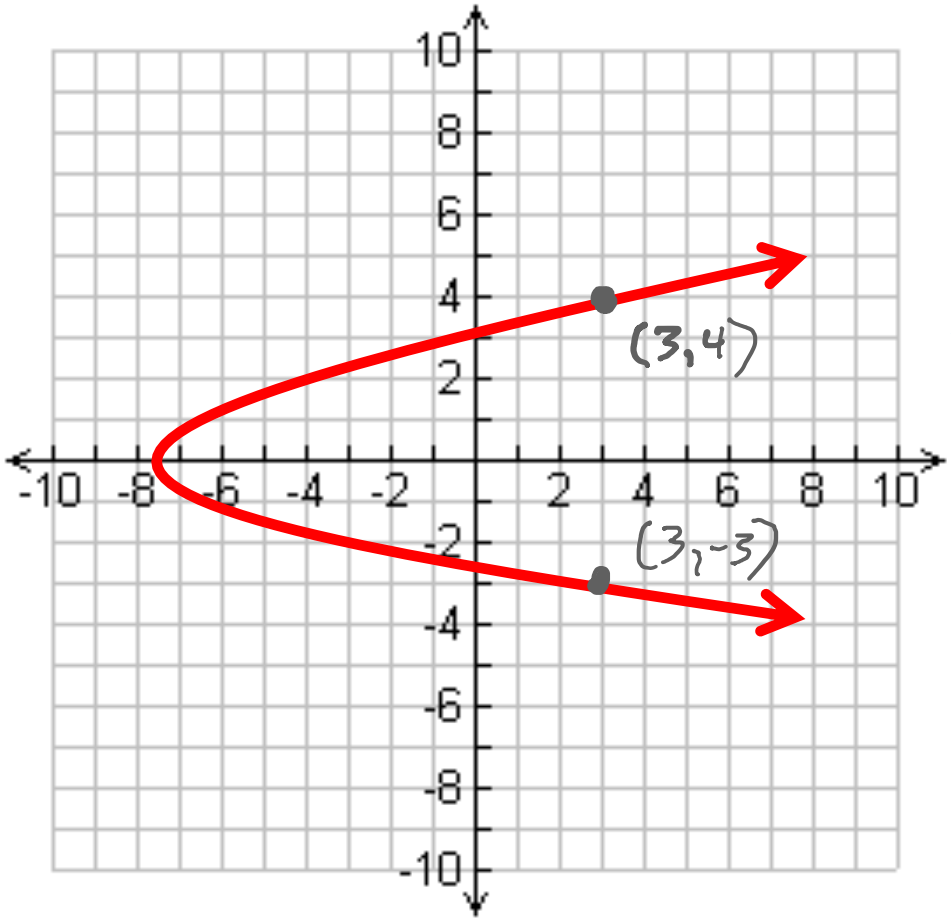
Yes; each x-value has only 1 y-value

Function?



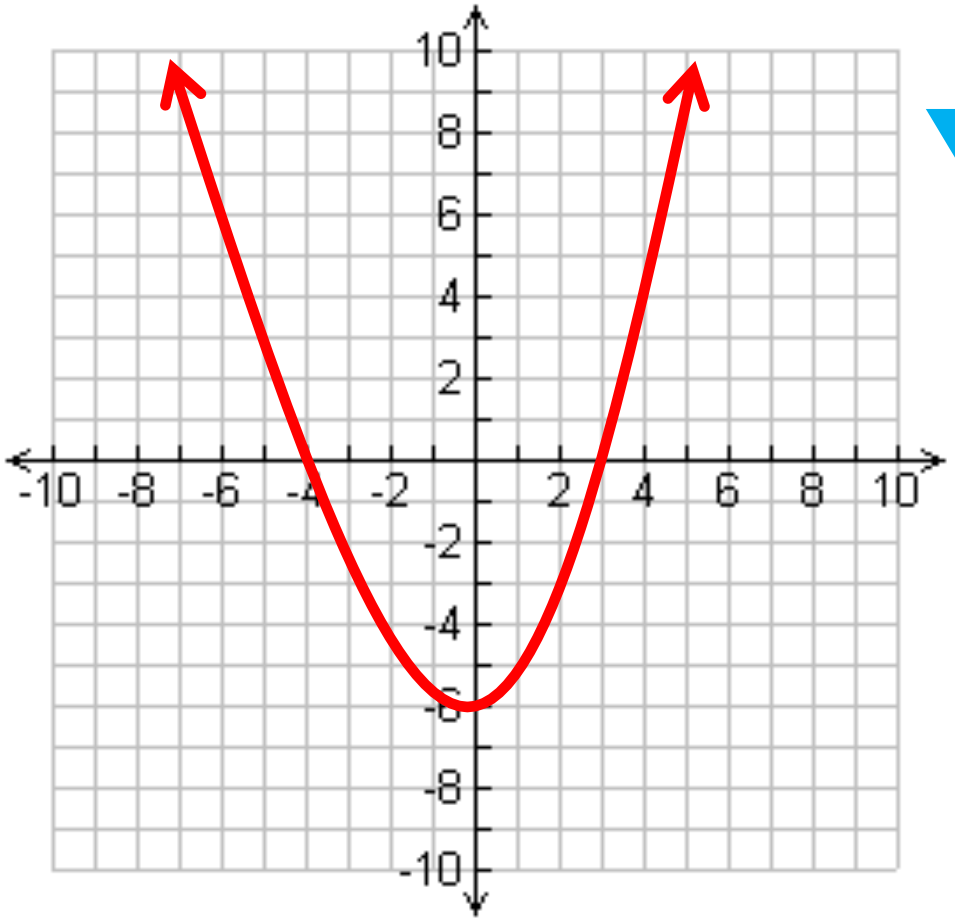
No; the input of "4" has multiple outputs

Function? (COPY THIS ONE FOR YOUR NOTES)



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

Function? **(COPY THIS ONE FOR YOUR NOTES)**

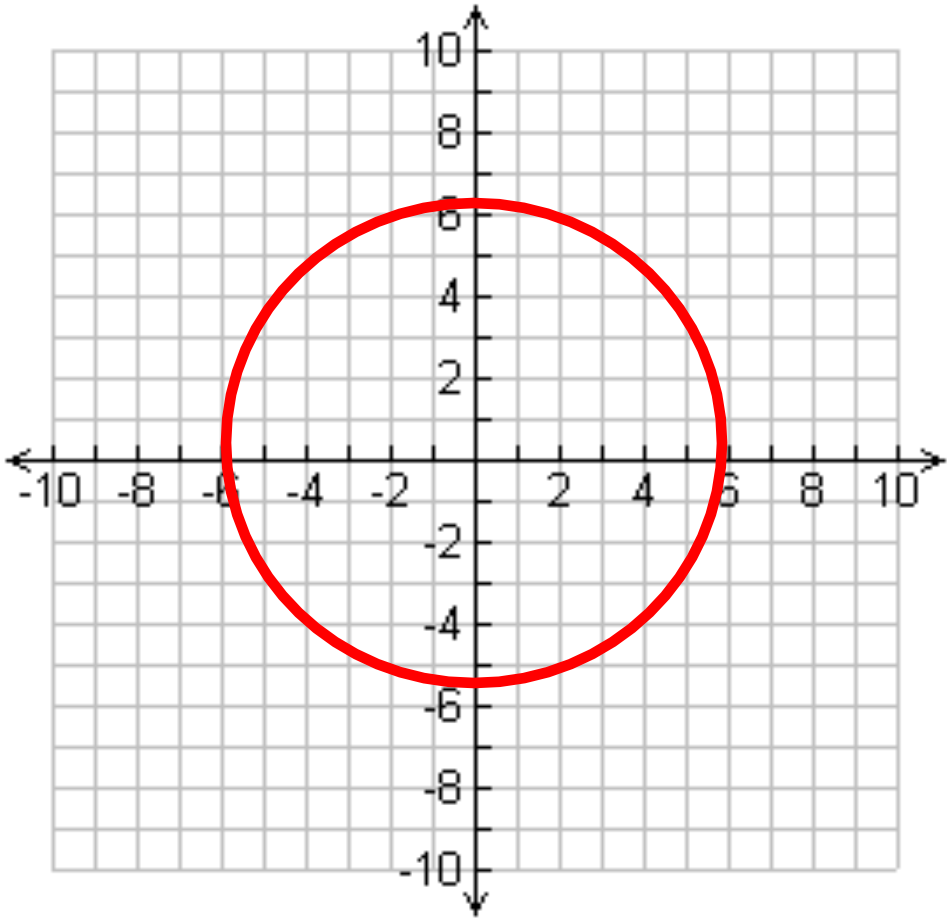


Yes

Rules for graphs of functions

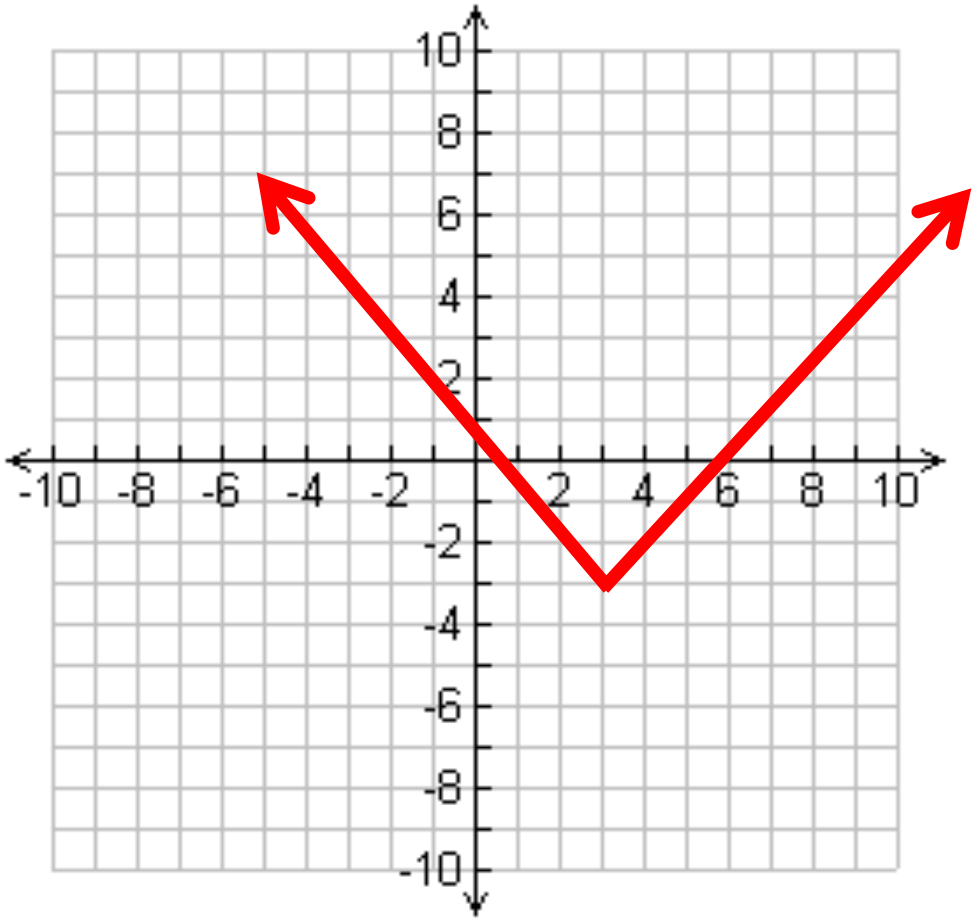
- **ON A GRAPH:**
  - **The x-value (horizontal) is the INPUT and the y-value (vertical) is the OUTPUT.**
  - **To be a function, each x-value can only have one y-value.**

Function?



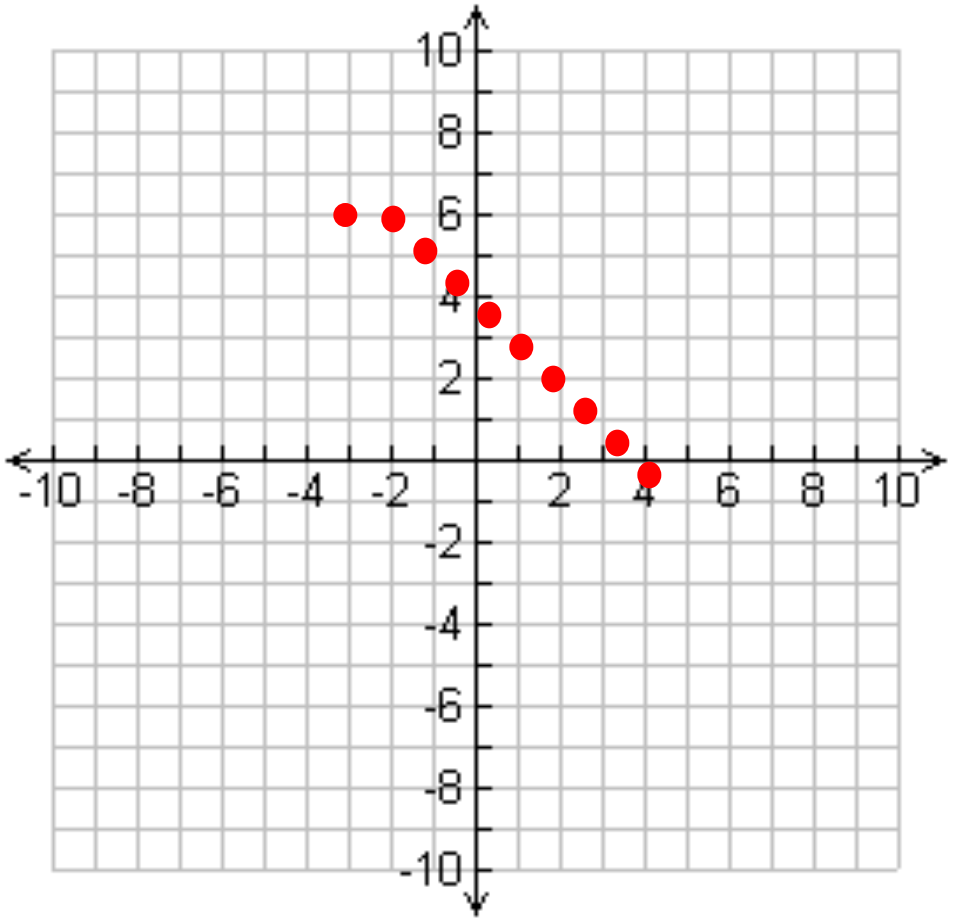
No

Function?



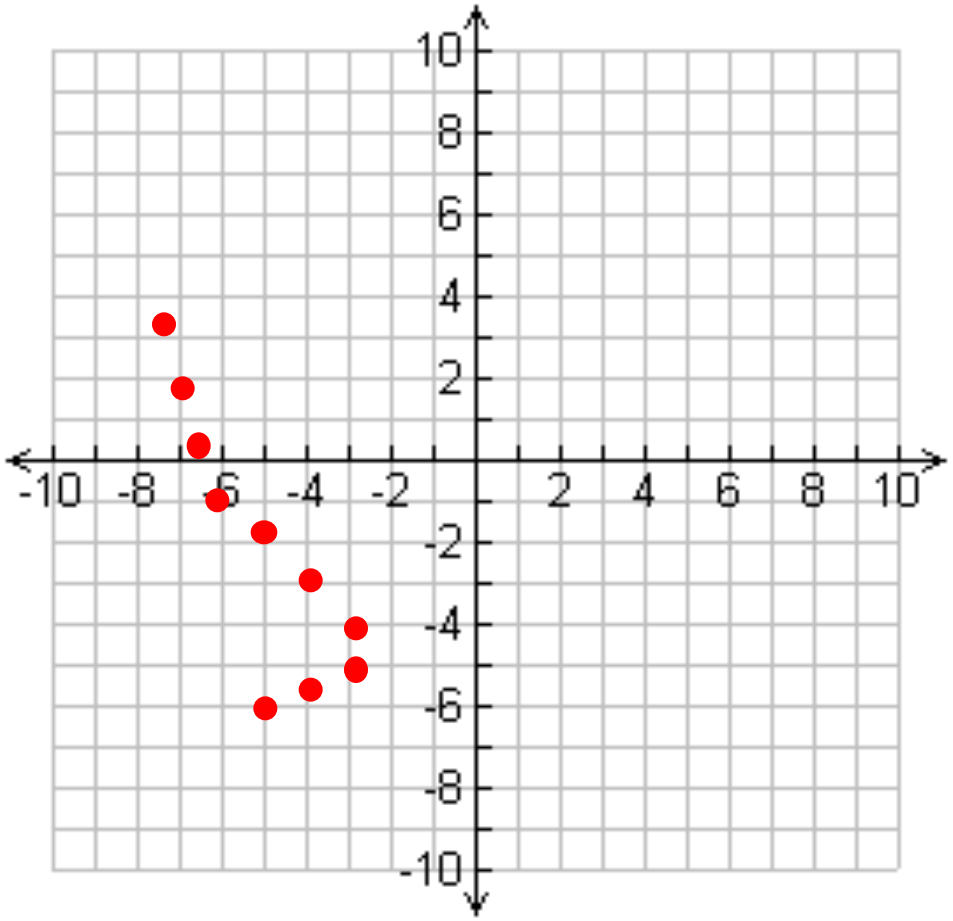
Yes

Function?



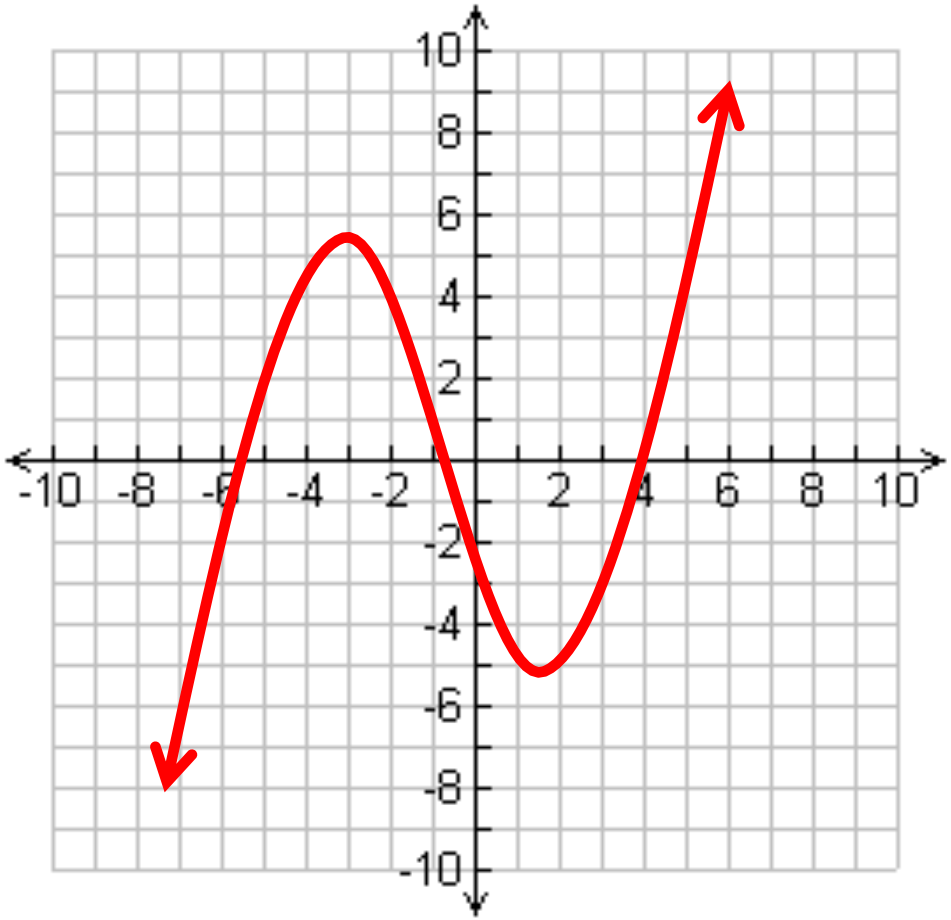
Yes

Function?



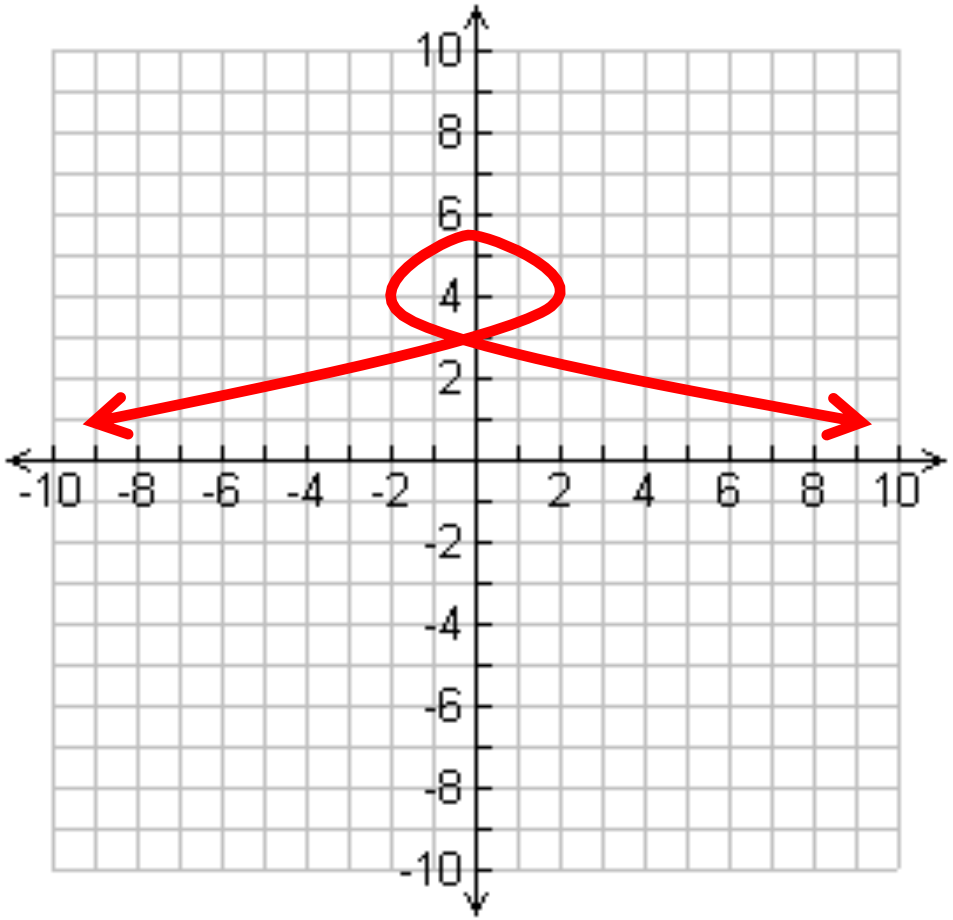
No

Function?



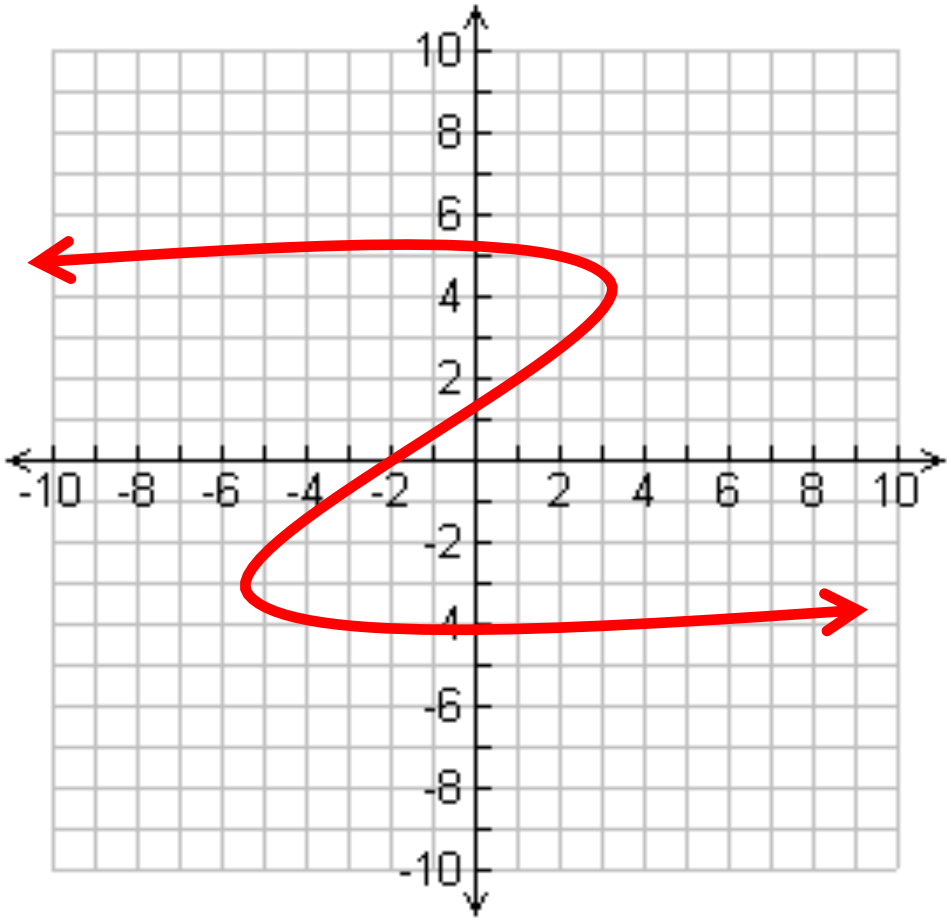
Yes

Function?



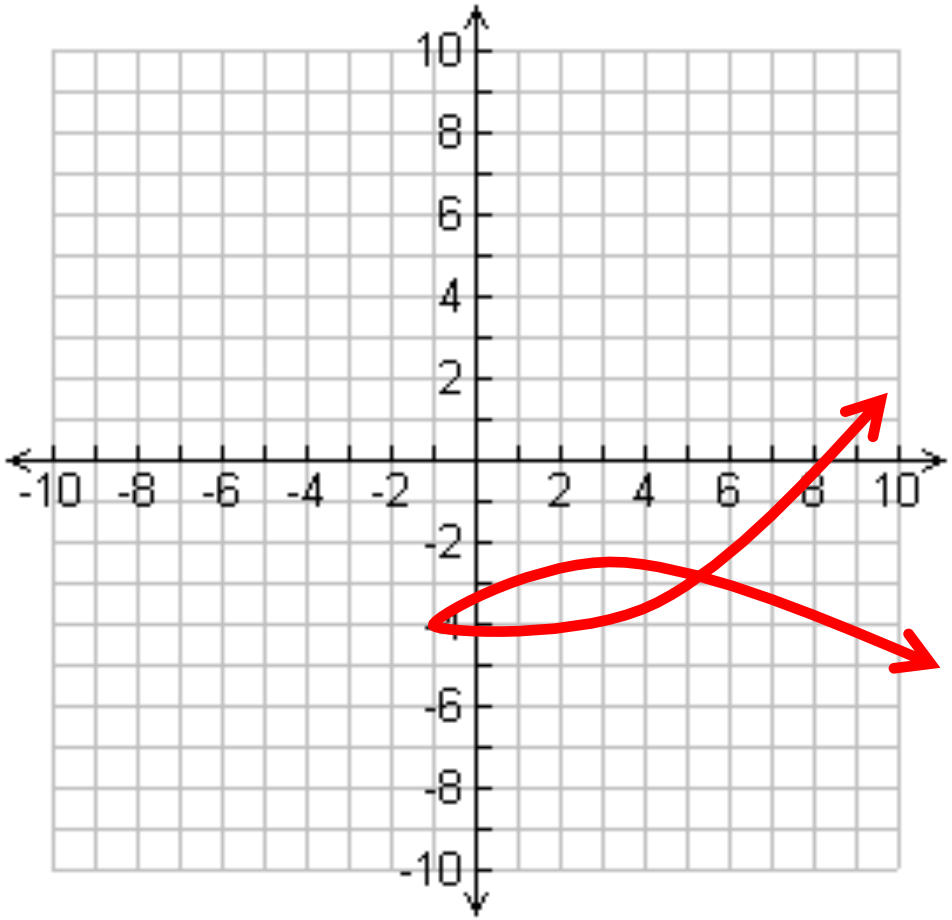
No

Function?



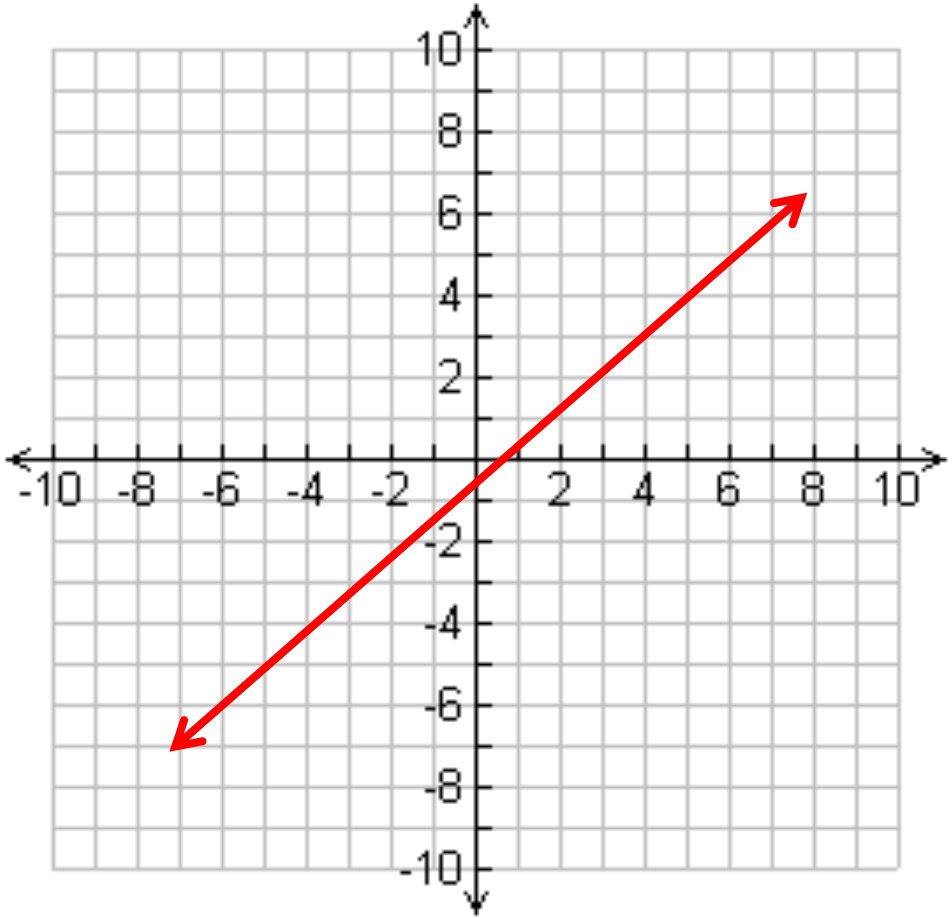
No

Function?



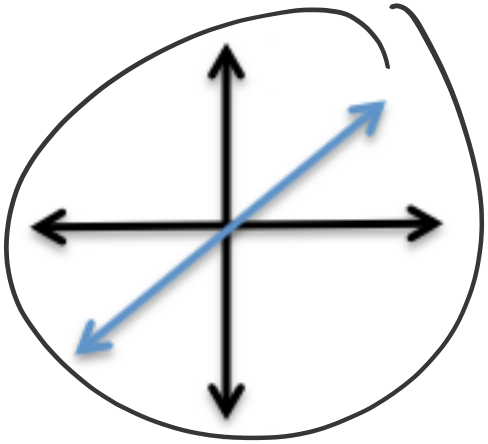
No

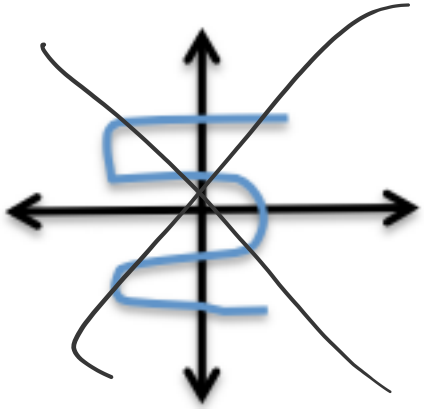
Function?



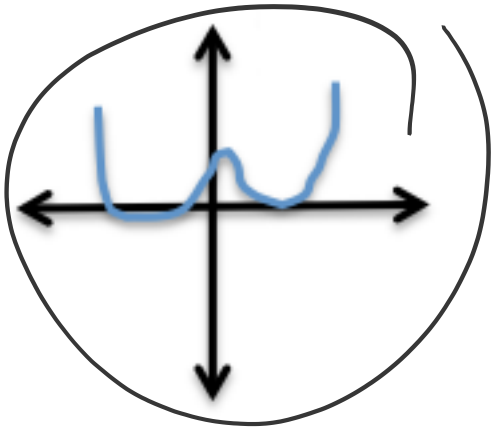
Yes

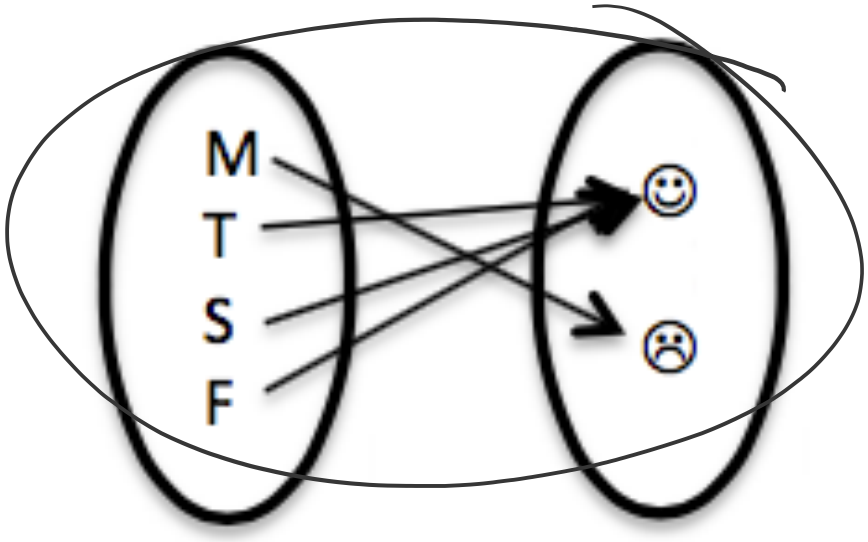
Which are functions?



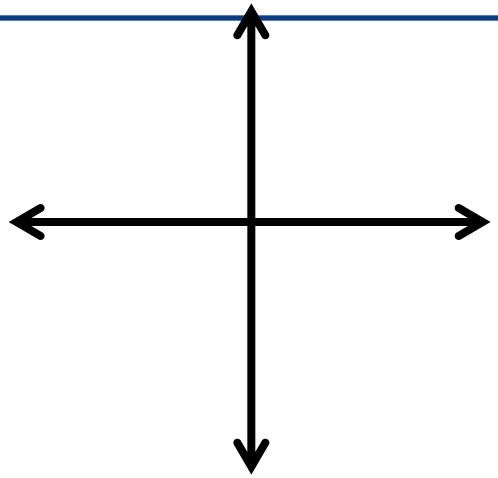


x	1	2	3	4
y	2	2	2	2

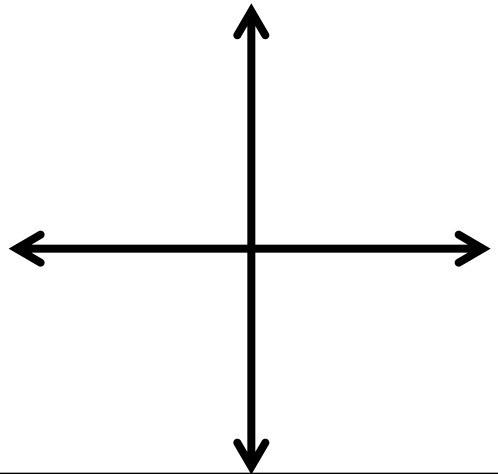




Add **five** points to the graph so that it would **not** be a function.



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.

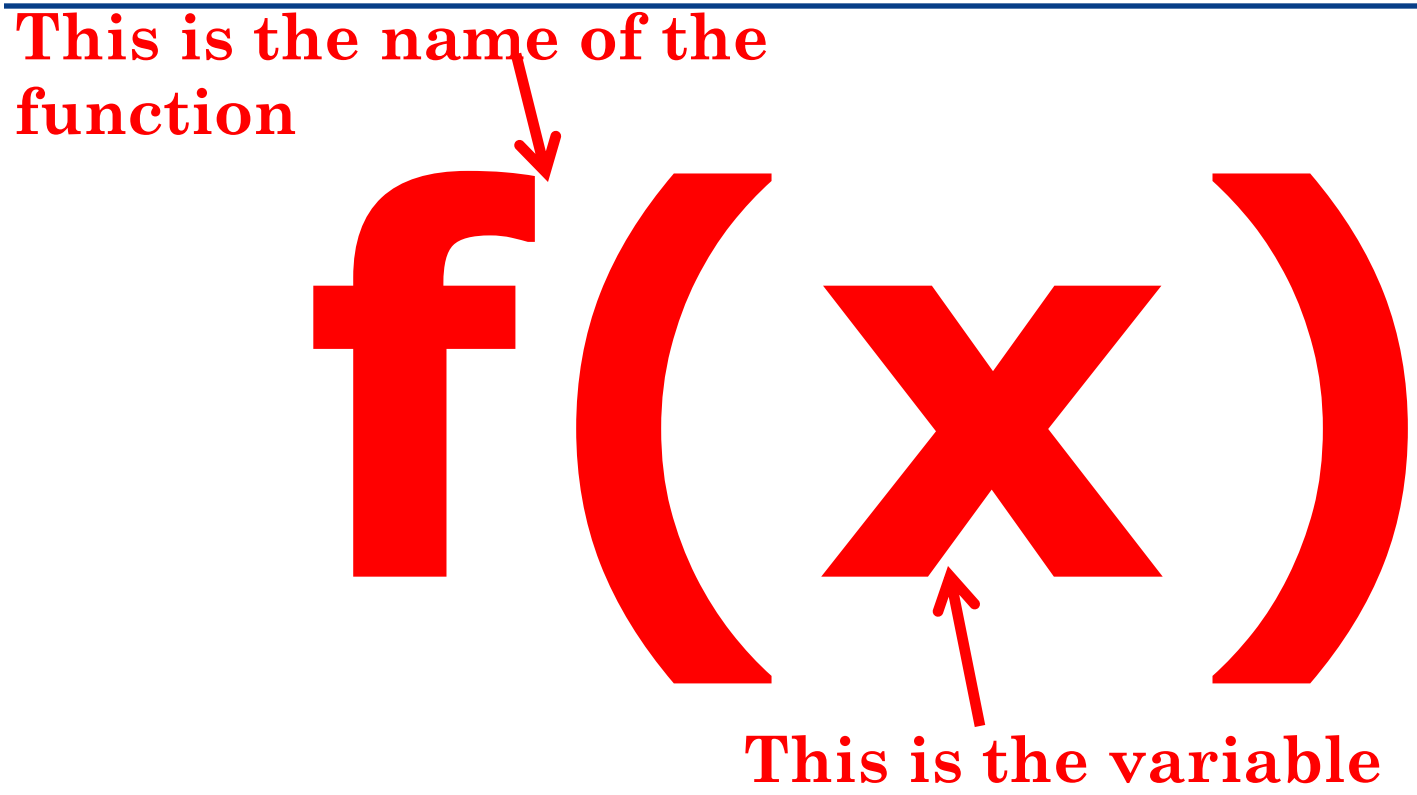
WITH YOUR GROUP:

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

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

1, 4, 5, 10 are functions

Function Notation



- **Read: "f of x"**

Evaluating Functions

- Use the following functions:

a(x) = 4x – 2 **b(x) = -9 + x**

c(x) = x^2 + 1

1) What is a(3)?

a(3) = 4(3) – 2
a(3) = 12 – 2
a(3) = 10

2) What is c(-3)?

c(-3) = $(-3)^2$ + 1
c(-3) = 9 + 1
c(-3) = 10

3) What is b(100)?

b(100) = -9 + 100
b(100) = 91

IMPORTANT

- **f(x) <u>DOES NOT MEAN</u> "f times x"**
- **f(5) means "What do you get when you plug "5" into the function "f"?"**

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:

$r(x) = -2x + 8$ **$s(x) = 3x^2$** **$t(x) = |x - 2|$**

1. **s(5)** =75
2. **t(5)**=3
3. **r(-6)**=20
4. **t(-4)** =6
5. **s(-3)**=27

Homework

Worksheet