

5-15-19

Aim: SWBAT write linear function rules.

HW: Packet Page 13

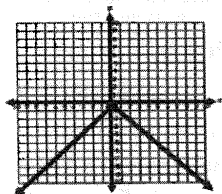
Review due Monday

Test Tuesday

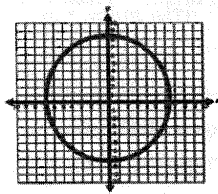
Final Review Packet due June 3rd

Do Now: Packet Page 11

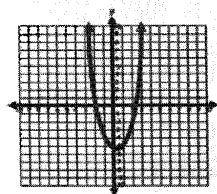
HW: Which of the following represent functions? Are the functions Linear?



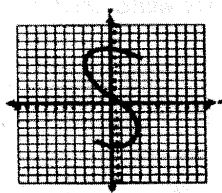
Nonlinear Function



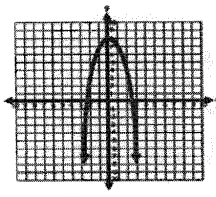
Not a function



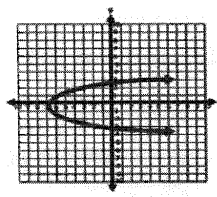
Nonlinear Function



Not a function



Nonlinear Function



Not a function

For the following functions, find the outputs for the given inputs.

$$f(x) = 3x + 7$$

$$g(x) = \frac{x - 6}{2}$$

$$1) f(2) = 3(2) + 7$$

$$f(2) = 6 + 7$$

$$f(2) = 13$$

$$2) g(20) = \frac{20 - 6}{2}$$

$$g(20) = \frac{14}{2}$$

$$g(20) = 7$$

$$2) f(-3) = 3(-3) + 7$$

$$f(-3) = -9 + 7$$

$$f(-3) = -2$$

$$3) g(0) = \frac{0 - 6}{2}$$

$$g(0) = \frac{-6}{2}$$

$$g(0) = -3$$

$$4) f(g(20))$$

$$g(20) = \frac{20 - 6}{2}$$

$$g(20) = \frac{14}{2}$$

$$g(20) = 7$$

$$f(7) = 3(7) + 7$$

$$f(7) = 21 + 7$$

$$f(7) = 28$$

$$5) g(f(7))$$

$$f(7) = 3(7) + 7$$

$$f(7) = 21 + 7$$

$$f(7) = 28$$

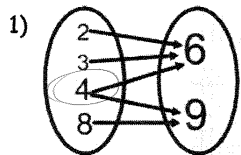
$$g(28) = \frac{28 - 6}{2}$$

$$g(28) = \frac{22}{2}$$

$$g(28) = 11$$

DO NOW - Is a relation a function?

For questions 1-3, state the domain and range. Then state if the relation is a function.



Domain  $\{2, 3, 4, 8\}$   
 Range  $\{6, 9\}$   
 Function? No

2) 

input	-2	5	7
output	2	5	-7

Domain  $\{-2, 5, 7\}$   
 Range  $\{2, 5, -7\}$   
 Function? Yes

3) (3, 4) (4, 6) (2, 1)

Domain  $\{2, 3, 4\}$   
 Range  $\{1, 4, 6\}$   
 Function? Yes

4) Given  $f(7) = 13$ , what was the input, what is the output?

Input: 7 ; Output: 13

5) Given  $g(x) = -2x + 7$ , what is  $g(9)$ ?

$$g(9) = (-2)(9) + 7$$

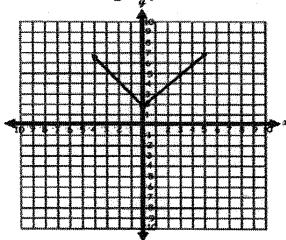
$$g(9) = -18 + 7$$

$$g(9) = -11$$

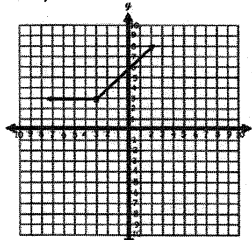
6) Given  $h(x) = 2x - 2$  and the domain  $\{-1, 0, 1\}$ , find the range.

$$\begin{matrix} h(-1) = 2(-1) - 2 & h(0) = 2(0) - 2 & h(1) = 2(1) - 2 \\ h(-1) = -2 - 2 & h(0) = 0 - 2 & h(1) = 2 - 2 \\ h(-1) = -4 & h(0) = -2 & h(1) = 0 \end{matrix} \quad \{ -4, -2, 0 \}$$

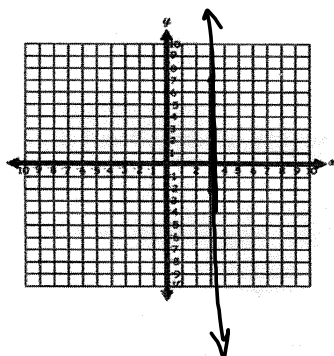
7) Look at the graph for each of these relations: Are they functions? Are the functions linear?



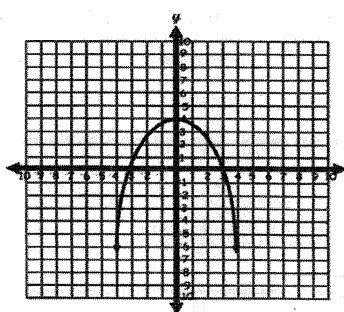
Nonlinear Function



Nonlinear Function



Not a function



Nonlinear function

AIM: SWBAT write linear function rules.

A linear function rule relates each input value with its corresponding output value using the form  $y = mx + b$  or  $f(x) = mx + b$  where "m" is the slope or constant rate of change, and "b" is the y-intercept. The graph of a linear function is always a straight line.

A non-linear function has an equation where the exponent of the variable is not 1 or the exponent is a variable and the graph is not a straight line. In non-linear functions there is not a constant rate of change.

Determine whether each of the following is linear or non-linear. If it is linear, write the function rule. Show your work.

1)

Input x	-4	-2	0	2	4
Output y	1	3	5	7	9

$\frac{\Delta y}{\Delta x} = \frac{2}{2} = 1$  Linear  
 $y = x + 5$

2)

x	f(x)
1	1
2	8
3	27
4	64

Nonlinear

3)

x	-2	0	2	4
f(x)	-3	-2	-1	0

Linear  
 $f(x) = \frac{1}{2}x - 2$

4) (3, 3), (5, 7), (-4, -11)

$\frac{4}{2} = 2$      $\frac{-18}{-9} = 2$   
 linear  $y = 2x - 3$

5)

linear  
 $y = -2x + 9$

6)

x	3	5	7	9
y	10	6	-2	-18

nonlinear

7) (-2, 5) (-1, 2) (0, 1) (1, 2) (2, 5)

nonlinear

**Homework:**

Circle the nonlinear functions. Explain why the equation is non-linear.

1)  $y = x^2 + 2x + 12$

2)  $y = 8x - 9$

3)  $y = 2^x$

4)  $y = x$

5)  $y = 5x^4 - 7x^3 + 13$

6)  $y = 2x + 5 + 5x$

7)  $f(x) = |x|$

8)  $f(x) = \frac{8}{x}$

9)  $g(x) = x^3$

Determine if the function represented is **linear** or **nonlinear**. Explain. For the linear functions, determine the function rule (equation)

10)

x	-10	-14	-18	-24
y	6	10	16	24

13) (-1, 5) (0, 4) (1, 5) (2, 8)

11)

x	-3	-2	-1	0
f(x)	8	5	2	-1

14) (2, 3) (3, 4) (4, 5)

12)

x	-2	-1	0	1
y	5	6	7	8

15) (2, 10) (4, 7) (6, 4)