

Your Name

Mrs. T

10/30/2020

Notes

LESSON 3.2

LINEAR AND NON LINEAR FUNCTIONS

Objective: To be able to determine a linear and non linear function from ordered pairs, tables, graphs, and equations.

Virtue/Skill: Just like Linear functions are a subset of Functions, which are a subset of Relations. We are a part of a family, which is a part of a community, which is a subset of the population, and so on. We each have unique qualities but we are a part of something bigger.

Relation- a set of ordered pairs

Function- a set of ordered pairs where each x input has exactly one y output

vocabulary
recap

Linear Function - a set of ordered pairs where the change in x and the change in y is constant

Is it linear?

From an Equation

Ask: Does it have a y?

Are x and y both to the first power?

Are x and y only added or subtracted?

~~2xy~~ $5y = 61$

✓✓ Not Linear
x and y cannot be multiplied

$y = -13$

✓✓✓ Linear

$y = x^2 + 3$

✓ X Not Linear

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

✓✓✓ Linear

$5x - y = 7$

✓✓✓ Linear

$y = 3^x - 1$

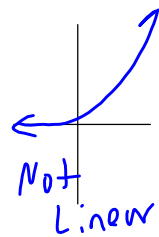
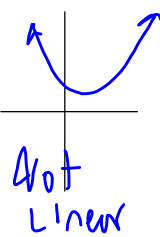
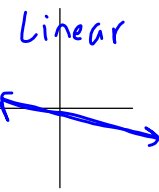
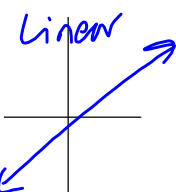
x is the exponent Not Linear

From a Graph

Linear

Ask: Is it a straight line?

Is it not a vertical line?



Is it linear?

From a Table or
Ordered Pairs

Ask: If I take any two points, and divide the difference in y by the difference in x, do I get the same ratio?

Do it- subtract two x's and their two y's, and divide

$$\frac{y_1 - y_2}{x_1 - x_2}$$

Linear Linear Linear

x	y
0	0
1	5
2	10
3	15

x	y
-1	3
1	9
2	12
5	21

x	y
-2	8
2	5
6	2
10	-1

$\frac{5-0}{1-0} = \frac{5}{1} = 5$
 $\frac{10-5}{2-1} = \frac{5}{1} = 5$
 $\frac{15-10}{3-2} = \frac{5}{1} = 5$
 $\frac{9-3}{2-(-1)} = \frac{6}{3} = 2$
 $\frac{12-9}{2-1} = \frac{3}{1} = 3$
 $\frac{21-9}{5-1} = \frac{12}{4} = 3$
 $\frac{5-8}{2-(-2)} = \frac{-3}{4} = -\frac{3}{4}$
 $\frac{2-5}{6-2} = \frac{-3}{4} = -\frac{3}{4}$
 $\frac{-1-2}{10-6} = \frac{-3}{4} = -\frac{3}{4}$

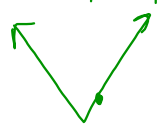
Not Linear Not Linear

x	y
0	0
1	1
2	4
3	9

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

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

$\frac{1-0}{1-0} = 1$
 $\frac{4-1}{2-1} = 3$
 $\frac{4-5}{1-(-1)} = -\frac{1}{2}$
 $\frac{3-4}{0-(-1)} = -1$
 $\frac{4-3}{1-0} = 1$



Homework:

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5. Not Linear

6. Linear