

2.4 Linear, Exponential or Neither?

A Practice Understanding Task



CC BY John Sherland
<https://flic.kr/p/9aureh>

For each representation of a function, decide if the function is linear, exponential, or neither.
 Give at least 2 reasons for your answer.

1.

Linear Exponential Neither

Why? straight line
 slope -constant
 continuous-connected

2. Tennis Tournament

Rounds	1	2	3	4	5
Number of Players left	64	32	16	8	4

There are 4 players remaining after 5 rounds

Linear Exponential Neither

Why? Multiply $\frac{1}{2}$
 Discrete

3.

$$y = 4x$$

$$y = mx + b$$

Linear

Exponential

Neither

Why?

slope $\rightarrow 4$

$b \rightarrow 0$

4.

This function is decreasing at a constant rate

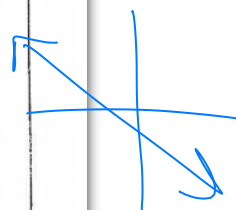
Linear

~~Exponential~~

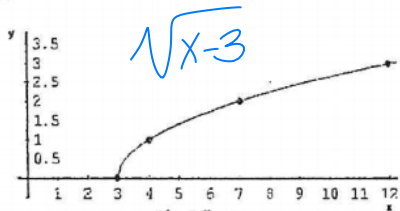
Neither

Why?

never changing slope



5.



Linear

Exponential

Neither

Why?

no constant slope
OR
constant Ratio

6. A person's height as a function of a person's age (from age 0 to 100)

x	y inches
1	24
20	63
80	54

Linear Exponential **Neither**

Why? *Varies in slope over time*

7. *solve for y

$$-3x = 4y + 7$$

$$-7 \quad -7$$

$$\frac{-3x - 7}{4} = \frac{4y}{4}$$

$$y = -\frac{3}{4}x - \frac{7}{4}$$

Linear Exponential Neither

Why? slope = $-\frac{3}{4}$
never changes

6.

x	y
-2	23
0	5
2	-13
4	-31
6	-49

+2 ↙
+2 ↙
+2 ↙
+2 ↙

↘ -18
↘ -18
↘ -18
↘ -18

Linear Exponential Neither

Why? $\frac{-18}{2} = -9 \rightarrow$ slope

9.

Height in inches	Shoe Size
62	6
74	13
70	9
67	11
53	4
58	7

Linear

Exponential

Neither

Why?

change varies
over time

10.

The number of cell phone users in Centerville as a function of years, if the number of users is increasing by 75% each year.

Linear

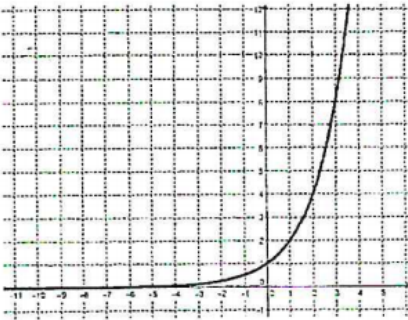
Exponential

Neither

Why? X every year

Discrete - can't have $\frac{1}{2}$
peeps or phones

11.



Linear

Exponential

Neither

Why?

curve \rightarrow multiply
Continuous

12.

The time it takes you to get to work as a function the speed at which you drive

Linear

Exponential

Neither

But while driving - constant speed

Why?

The faster you drive, the quicker you get there

The slower you drive, the longer you take to get there

Continuous

13.

$$y = 7x^2$$

Linear

Exponential

Neither

Why?

$x^2 \rightarrow$ Quadratic

Continuous

14.

Each point on the graph is exactly $\frac{1}{3}$ of the previous point.

Linear

Exponential

Neither

Why?

Multiply by $\frac{1}{3}$
curve

15.

$$f(1) = 7, f(2) = 7, f(n) = f(n-1) + f(n-2)$$

7, 7, 14, 21, 35, 56...

Linear

Exponential

Neither

Why?

No constant Rate of Change

Discrete \rightarrow whole #

16.

$$f(1) = 1, f(n) = \frac{2}{3}f(n-1)$$

Linear

Exponential

Neither

Why?

Multiply by $\frac{2}{3}$

Continuous