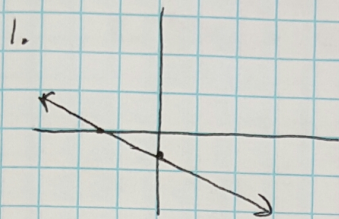


## 2.4 Class Notes

### 2.4 Linear, Exponential, or Neither

For each of the situations answer the following questions

- Is it discrete or continuous?
- Is it linear, exponential, or neither?
- What is the domain?



- Continuous - connected
- Linear - straight line
- $\{x \mid x \in \mathbb{R}\}$   
Continuous has to be real numbers

2.

Tennis Tournament					
Rounds	1	2	3	4	5
Players left	64	32	16	8	4

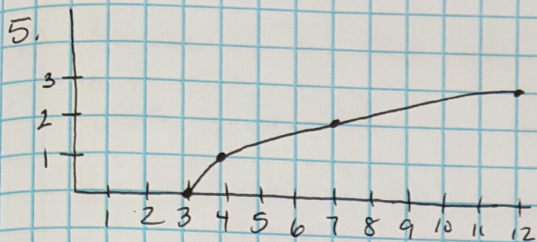
$\div 2$     $\div 2$     $\cdot \frac{1}{2}$     $\cdot \frac{1}{2}$

- Discrete - 1.5 rounds doesn't make sense
- Exponential -  
Dividing by  $2^{\cdot} (\cdot \frac{1}{2})$ .
- $\{x \mid x \in \mathbb{N}\}$   
Inputs are natural.

3.  $y = 4x$

- Continuous - we assume equations are continuous
- Linear - It is in the form of a line ( $y = mx + b$ )
- $\{x \mid x \in \mathbb{R}\}$





$n$	$f(n)$
3	0
4	1
7	2
12	3

- a. Continuous - connected  
 b. Neither - the pattern in the table isn't linear or exponential  
 c.  $\{x \mid x \in \mathbb{R}\}$  - continuous

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

a. Continuous

b. Linear

c.  $\{x \mid x \in \mathbb{R}\}$

Since there is an  $x$  and a  $y$  and there are no exponents this is a linear equation.

There is not any information telling us this is discrete so we assume it is continuous.

8.

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

a. Discrete - this is a scatter plot

b. Neither - Scatter plot doesn't make a line or curve.

c.  $\{x \mid x \in \mathbb{N}\}$

All of the  $x$ 's are natural numbers.



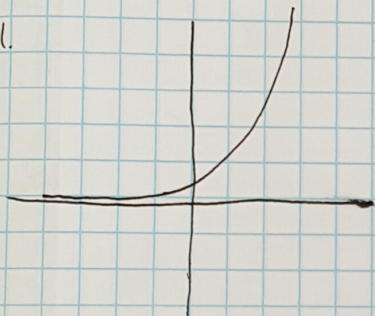
10. Number of cell phone users in Centerville as a function of years, if the number of users is increasing by 75% each year.

a. Continuous - the number of users increases throughout the year.

b. Exponential - increasing by a percentage is exp.

c.  $\{x \mid x \in \mathbb{R}\}$

11.



a. Continuous - connected

b. exponential - curved

c.  $\{x \mid x \in \mathbb{R}\}$

13.  $y = 7x^2$

a. Continuous - If it's an equation we assume it is continuous.

b. Neither -  $x$  is not the exponent

c.  $\{x \mid x \in \mathbb{R}\}$

15.  $f(0) = 1$   
 $f(n+1) = \frac{2}{3} f(n)$

a. Discrete - Recursive is only for sequences.

b. Exponential - Multiplying by  $\frac{2}{3}$

c.  $\{x \mid x \in \mathbb{N}\}$

Reflection: