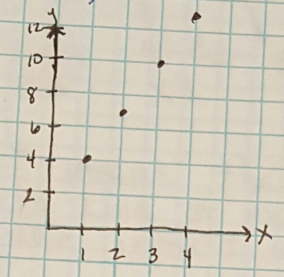
2.3 Class Notes

2.3 Linear vs. Exponential
Discrete vs. Continuous
Domain

Make the graph and equations for this sequence.

4, 7, 10, 13, ...

n	f(n)	
1	4	+3
2	7	+3
3	10	+3
4	13	



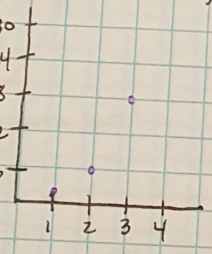
$f(n) = f(n-1) + 3, \; f(1) = 4$

$f(n) = 3n + 1$

Linear and arithmetic
Discrete
Domain – Natural #'s
$\mathbb{N}$

This sequence 2, 6, 18, ...

n	f(n)	
1	2	·(3)
2	6	·(3)
3	18	·(3)
4	54	



$f(n) = f(n-1) \cdot 3, \quad f(1) = 2$

$f(n) = 2 \cdot 3^{n-1}$ or $f(n) = \frac{2}{3} \cdot 3^{n}$

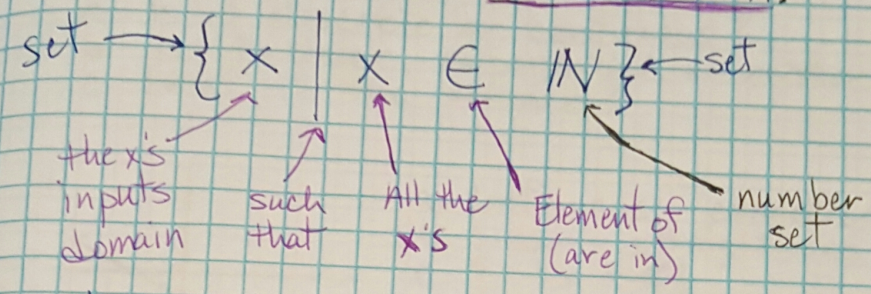
Exponential and geometric
Discrete
Domain – Natural #'s
$\mathbb{N}$

Are all sequences discrete?
YES!

Definition of sequences:
- Pattern, predictable
- Discrete
- Domain is the natural numbers — $\mathbb{N}$

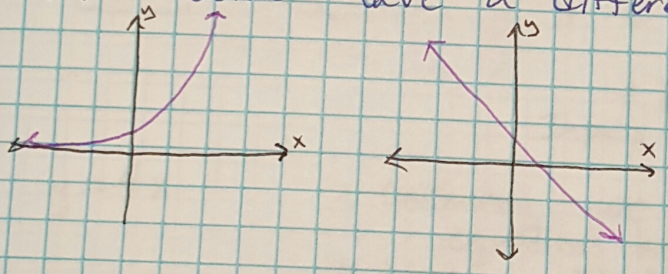
Domain is represented in a special, symbolic way.

This is called set notation.



This just means that in a sequence the only kind of numbers we use for the inputs are natural numbers.

A continuous relationship like the ones below have a different domain.



Domain → $\{x \mid x \in \mathbb{R}\}$

All continuous relationships have a domain in the real numbers. ($\mathbb{R}$)

Reflection: