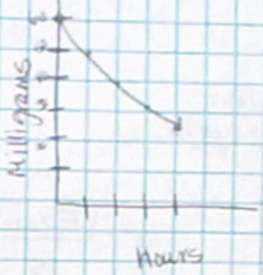


11. Medicine

- 60 milligrams of medicine @ the start
- 20% ineffective each hour
- $100\% - 20\% = 80\%$

hour	Medicine Mgr	Function
0	60	60
1		$60(-.8)$
2		$60(-.8)^2$
3	30.72	$60(-.8)^3$

$$f(x) = 60(-.8)^x$$



Exponential
Continuous
Domain: Hours \mathbb{R}^+
Not a sequence $\neq \mathbb{N}$

Functions

Linear

- Constant slope
- Straight line on graph

Exponential

$$f(x) = a \cdot b^x$$

- No constant slope
- Constant Ratio
- Graph is curved

Discrete

- Starts & stops
- No in between

Continuous

- "inbetweens make sense"

Discrete

Domain: $\mathbb{N}, \mathbb{Z}, \mathbb{Q}$

Continuous

Domain: \mathbb{R}

Domain

- x-values make sense
- $\mathbb{N}, \mathbb{Z}, \mathbb{Q}$

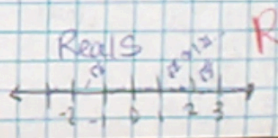
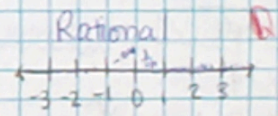
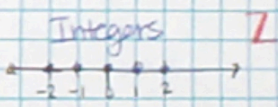
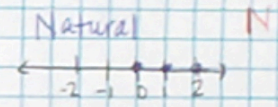
Arithmetic sequence

- Domain = \mathbb{N}

Geometric Sequence

- Domain = \mathbb{N}

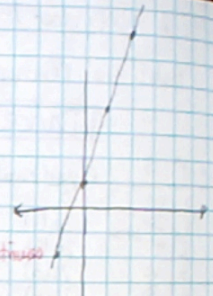
* Reals is the only one with no steps! Continuous



Example 1

Explicit Function
 $f(x) = 2x + 1$
Domain: \mathbb{R}

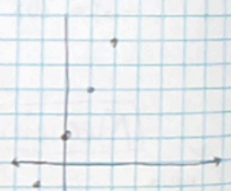
x	y
0	1
1	1+2
2	1+2+2
3	1+2(3)
x	1+2x



Example 2

Explicit Function
 $f(x) = 2x + 1$
Domain: \mathbb{Z}

x	y
0	1
1	1+2
2	1+2+2
3	1+2(3)
x	1+2x



Example 3

Explicit Function
 $f(x) = 2x + 1$
Domain: \mathbb{N}
* Only this one is a sequence; it is arithmetic
 $f(0) = 1$
 $f(x) = f(x-1) + 2$
Next = Prev + 2

Discrete



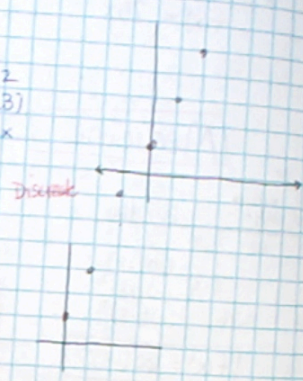
Example 4

Example 5

$\{ \dots, (a,3), (1,b), c \}$

Explicit function
 $f(x) = 2x + 1$
 Domain: \mathbb{Z}

x	y
0	1
1	1+2
2	1+2+2
3	1+2(3)
x	1+2x



Example 3

Explicit Function

$f(x) = 2x + 1$

Domain: \mathbb{N}

* Only this one is a sequence, it is arithmetic

$f(x) = (x+1) \cdot 2$
 Next point = Prev. + 2

Example 4

Example 5

$\{ \dots (0,3), (1,b), (\dots) \}$

Example 6

look at initial first

x	y
-2	0
1	12
4	24
7	36
10	48
13	60
16	72

yes
 Linear

Example 7

$f(x) = 3 \cdot 2^x$

x	y
0	3
1	6
2	12
3	24
4	48
5	96
6	192

$\frac{y_2}{y_1} = \frac{6}{3} = 2$