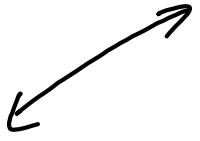
13-4 Notes Linear vs. Exponential

Linear

Linear patterns change by a common difference, or a number we add or subtract by to get from point to point.

The equation that represents a linear pattern is y= mx + b
m represents the slope or rate of change
b represents the y-int or initial value

The graph of a linear pattern is always a straight line.

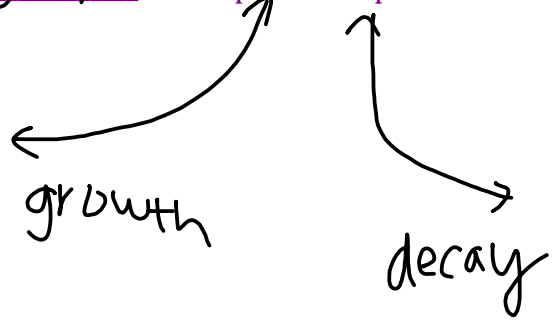


Exponential

Exponential patterns change by a common factor, or a number we mult/div. ($\cdot \frac{1}{5}$ or $\div$) by to get from point to point.

The equation that represents a linear pattern is y= $a \cdot b^x$ $y = a(b)^x$
a represents the y-int or initial value
b represents the base or rate of change

The graph of a exponential pattern is always a curve line.



State whether the following tables of values are linear or exponential and then write an equation.

y-int X=0

x	-2	-1	0	1
y	-6	-3	0	3

+3 +3 +3

linear

P of C y-int

$y = mx + b$

Equation: $y = 3x + 0$

$y = 3x$

x	0	1	2	3
y	2	8	32	128

·4 ·4 ·4

exp

y-int ✓ P of C ✓

$y = a \cdot b^x$

Equation: $y = 2 \cdot 4^x$

State whether the following tables of values are linear or exponential and then write an equation.

÷3 ·⅓

x	0	1	2	3
y	125	25	5	1

÷5

exponential

Equation: $125 \cdot \frac{1}{5}^x$

linear

x	0	2	4	6
y	-4	-2	0	2

+2 +2

linear

Equation: $y = x - 4$

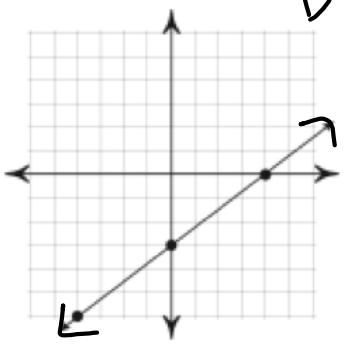
x	0	1	2
y	9	6	3

-3 -3

$y = -3x + 9$

Are the following graphs linear or exponential? Then state the domain and range.

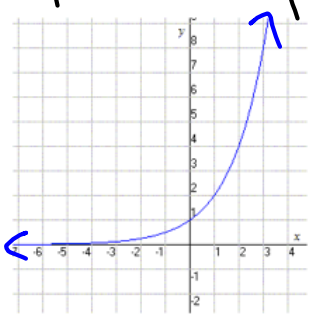
D: X L→R R: Y B→T



Type: Linear

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

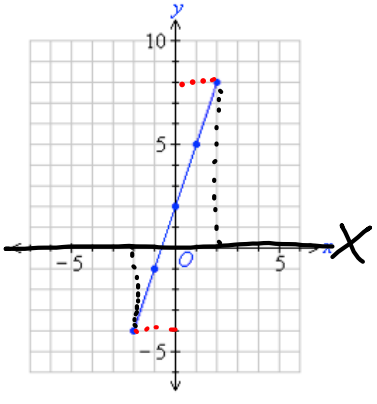


Type: exponential

Domain: $(-\infty, \infty)$

Range: $(0, \infty)$

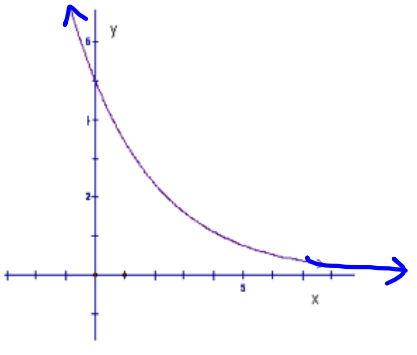
Are the following graphs linear or exponential? Then state the domain and range.



Type: linear

Domain: $[-2, 2]$

Range: $[-4, 8]$



Type: exponential

Domain: $(-\infty, \infty)$

Range: $(0, \infty)$