Simplify the following

$x^4 \cdot x^3 = xxxx\,xxx$

x^7

$\left(\frac{y}{3}\right)^2$ $\frac{y}{3}\frac{y}{3} = \frac{y^2}{3^2} = \frac{y^2}{9}$

$(ab)^4$ $ab\,ab\,ab\,ab$

a^4b^4

$\frac{k^2}{k^5} \quad \frac{kk}{kkkkk} = \frac{1}{k^3}$

$(3b)^4$ $81b^4$

$3b\,3b\,3b\,3b$

$(91)^0$ 1

Quiz Time!!

6-2 Linear vs. Exponential

Arithmetic Sequence:

Add or Subtract to get next number

Geometric Sequence:

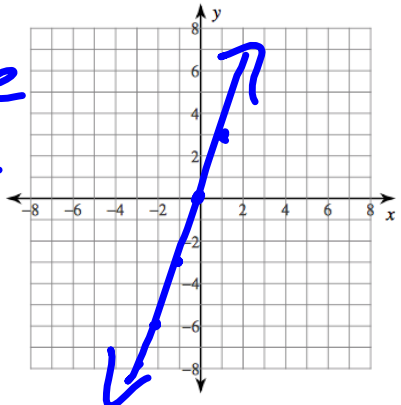
* or ÷ to get the next number

State whether the following tables are arithmetic or geometric and then graph them.

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

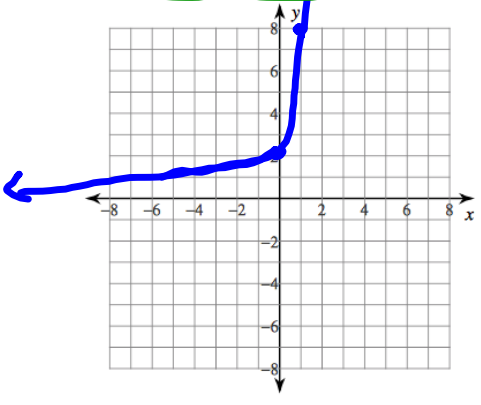
Arithmetic or geometric?

b/c rate is the same



x	0	1	2	3
y	2	8	32	128

Arithmetic or geometric?



Arithmetic/Linear Function

$$y = mx + b$$

$$m = \frac{\Delta y}{\Delta x}$$

Geometric/Exponential Function

$$y = a_1(r)^x$$

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

x	0	1	2	3
y	125	25	5	1

Equation: $y = 125\left(\frac{1}{5}\right)^x$

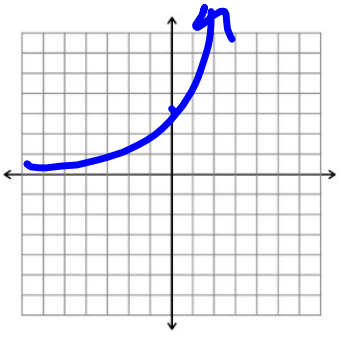
x	0	2	4	6
y	-4	-2	0	2

Equation: $y = mx + b$

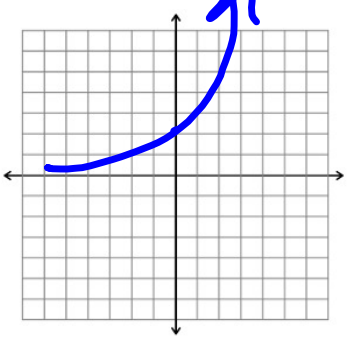
$y = \frac{2}{2}x + -4$

Use a graphing calculator to sketch the following graphs and state the common ratio and initial value

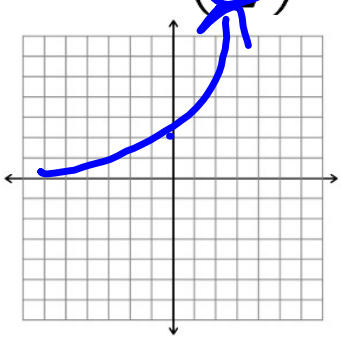
$y = 3(2)^x$



$y = 2(5)^x$

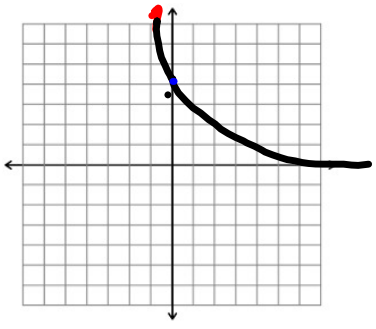


$y = 2\left(\frac{7}{2}\right)^x$

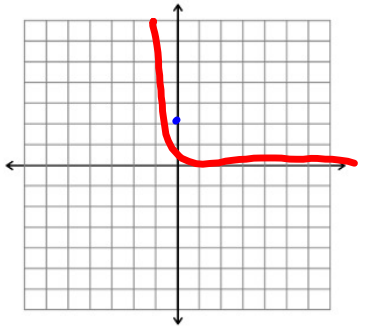


Use a graphing calculator to sketch the following graphs

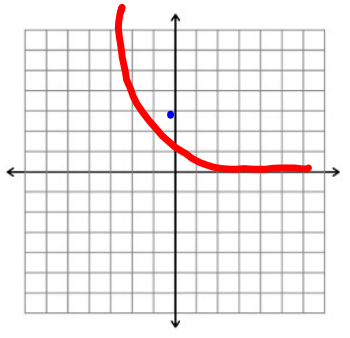
$y = 4\left(\frac{1}{2}\right)^x$



$y = 2(0.1)^x$



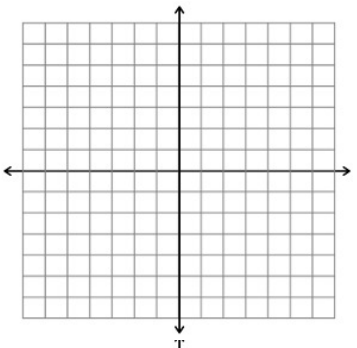
$y = 3\left(\frac{2}{3}\right)^x$



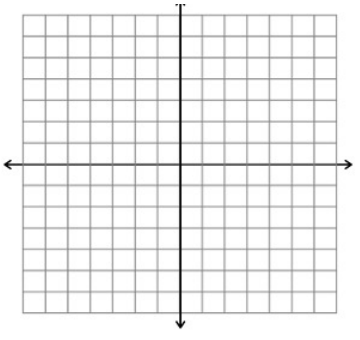
Exponential Growth vs Decay

Based on the last two slides, what is the relationship between the equations and the graphs? Draw an example of each.

Growth:

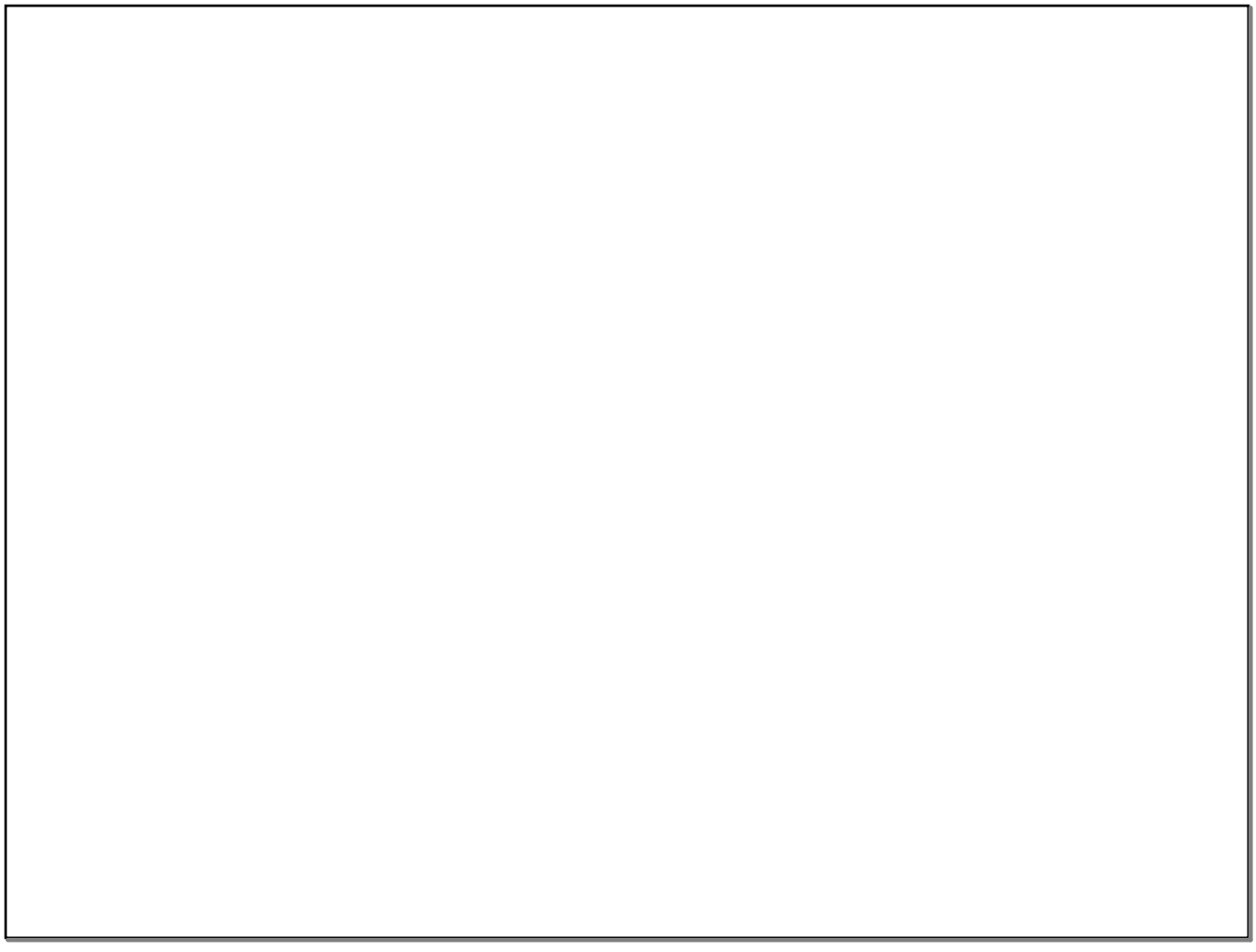


Decay:



State whether the following are examples of growth or decay and the y-intercept.

$y = 5(3)^x$ $y = 3(1.8)^x$ $y = 7(0.99)^x$

$y = 2\left(\frac{8}{3}\right)^x$ $y = 0.8\left(\frac{3}{2}\right)^x$ $y = 9\left(\frac{1}{6}\right)^x$

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