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Graphing Exponential Decay functions

Learning Target: I can identify a graph as exponential Decay.
I can graph an exponential function by creating a table of values.

An **exponential function** is $y = ab^x$

- Exponential functions are non linear.

Exponential Functions can **"decay"** which means starts off large and gets smaller.

Exponential Stuff: Are all written in the form of

$f(x) = \textbf{starting amount} \cdot \textbf{multiplier}^x$

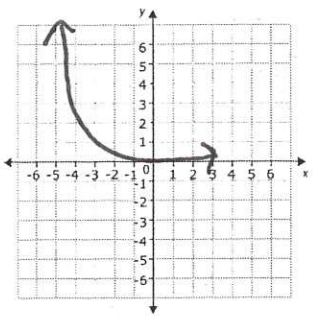
a $\quad$ b^x

$y = ab^x$

y-intercept

$0 \leq b \leq 1$

What does exponential decay look like?

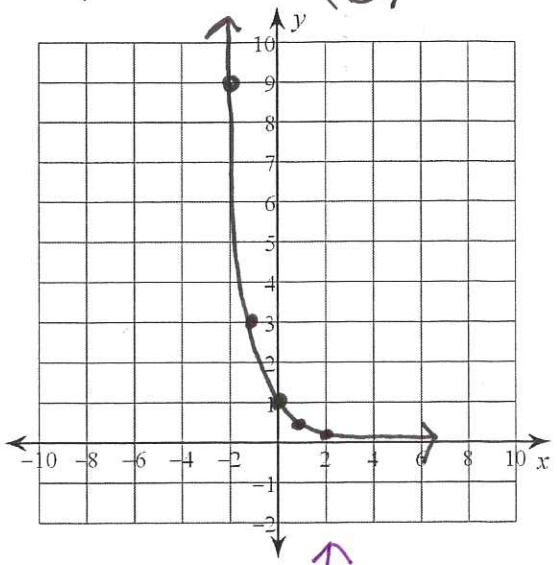


fraction or decimals

Graphing Review:

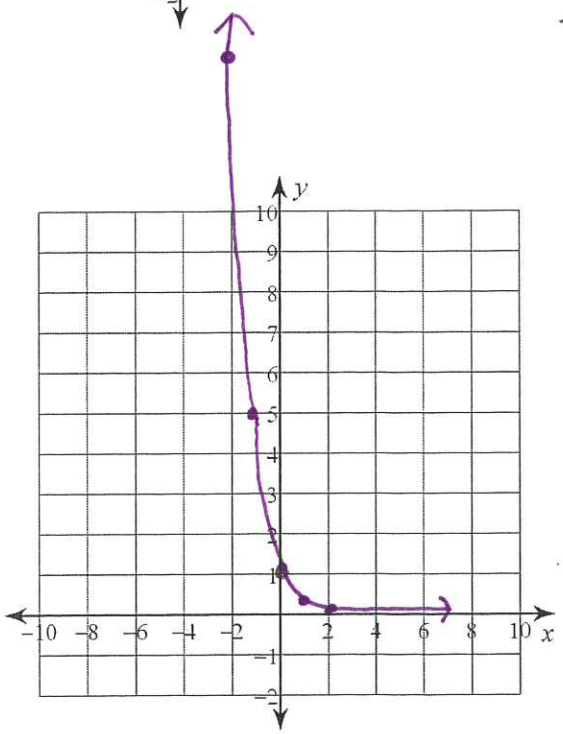
1.) Make a Table (2 negatives, zero, 2 positives)
2.) Plot the points
3.) Connect the points with a smooth curve

Examples: $f(x) = \left(\frac{1}{3}\right)^x$



x	$\left(\frac{1}{3}\right)^x$	y
-2	$\left(\frac{1}{3}\right)^{-2} = \frac{1^{-2}}{3^{-2}} = \frac{3^2}{1^2} =$	9
-1	$\left(\frac{1}{3}\right)^{-1} = \frac{1^{-1}}{3^{-1}} = \frac{3}{1}$	3
0	$\left(\frac{1}{3}\right)^0$	1
1	$\left(\frac{1}{3}\right)^1$	$\frac{1}{3} \approx .3$
2	$\left(\frac{1}{3}\right)^2 = \frac{1^2}{3^2} = \frac{1}{9}$	$\frac{1}{9} \approx .1$

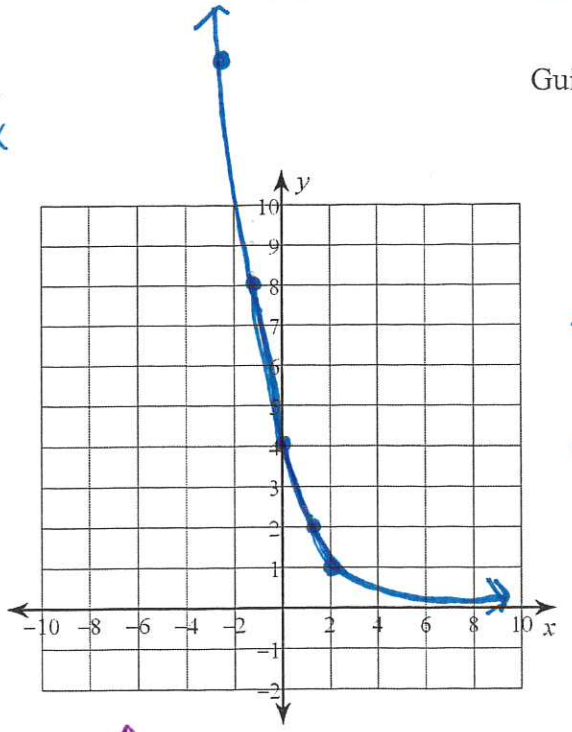
$f(x) = \left(\frac{1}{5}\right)^x$



x	$\left(\frac{1}{5}\right)^x$	y
-2	$\left(\frac{1}{5}\right)^{-2} = \frac{1^{-2}}{5^{-2}} = \frac{5^2}{1^2}$	25
-1	$\left(\frac{1}{5}\right)^{-1} = \frac{1^{-1}}{5^{-1}} = \frac{5}{1}$	5
0	$\left(\frac{1}{5}\right)^0$	1
2	$\left(\frac{1}{5}\right)^2 = \frac{1^2}{5^2} = \frac{1}{25}$	.04
1	$\left(\frac{1}{5}\right)^1 = \frac{1}{5}$	.2

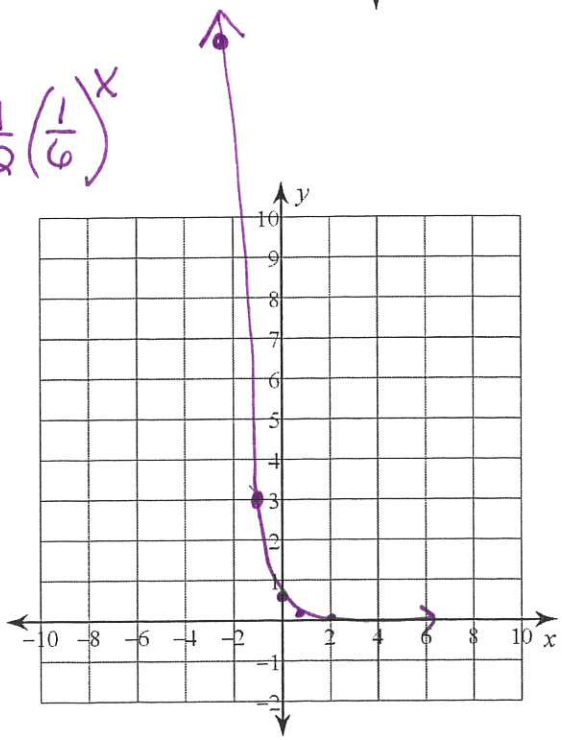
Guided Notes 7.5 &7.6: Graphing Exponential Decay
Algebra 1-Rogers

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



x	$4\cdot\left(\frac{1}{2}\right)^x$	y
−2	$4\cdot\left(\frac{1}{2}\right)^{-2}=4\cdot\frac{1^{-2}}{2^{-2}}=4\cdot\frac{2^2}{1^2}=\frac{4\cdot4}{1}$	16
−1	$4\cdot\left(\frac{1}{2}\right)^{-1}=4\cdot\frac{1^{-1}}{2^{-1}}=4\cdot\frac{2}{1}$	8
0	$4\cdot\left(\frac{1}{2}\right)^0=4\cdot1$	4
1	$4\cdot\left(\frac{1}{2}\right)^1=4\cdot\frac{1}{2}=\frac{4}{2}$	2
2	$4\cdot\left(\frac{1}{2}\right)^2=4\cdot\left(\frac{1^2}{2^2}\right)=4\cdot\frac{1}{4}=\frac{4}{4}$	1

$f(x)=\frac{1}{2}\left(\frac{1}{6}\right)^x$



x	$\frac{1}{2}\left(\frac{1}{6}\right)^x$	y
−2	$\frac{1}{2}\left(\frac{1}{6}\right)^{-2}=\frac{1}{2}\cdot\frac{1^{-2}}{6^{-2}}=\frac{1}{2}\cdot\frac{6^2}{1^2}=\frac{36}{2}$	18
−1	$\frac{1}{2}\left(\frac{1}{6}\right)^{-1}=\frac{1}{2}\cdot\frac{1^{-1}}{6^{-1}}=\frac{1}{2}\cdot6$	3
0	$\frac{1}{2}\left(\frac{1}{6}\right)^0=\frac{1}{2}\cdot1=\frac{1}{2}$	.5
1	$\frac{1}{2}\left(\frac{1}{6}\right)^1=\frac{1}{12}$	.08
2	$\frac{1}{2}\left(\frac{1}{6}\right)^2=\frac{1}{2}\cdot\frac{1}{36}=\frac{1}{72}$	.01