Graphing Exponential Growth functions

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

After viewing the video, in your own words, how would you define exponential growth?

An **exponential function** is a function in the form $y = ab^x$

- Exponential functions are non linear.

Exponential Functions can "**grow**", which means they start off small and quickly increase.

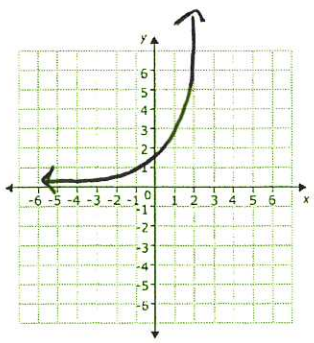
Exponential Stuff: Are all written in the form of

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

$f(x) = ab^x$

What does exponential growth look like?

a is the y-value where $x = 0$ and b is the multiplier.



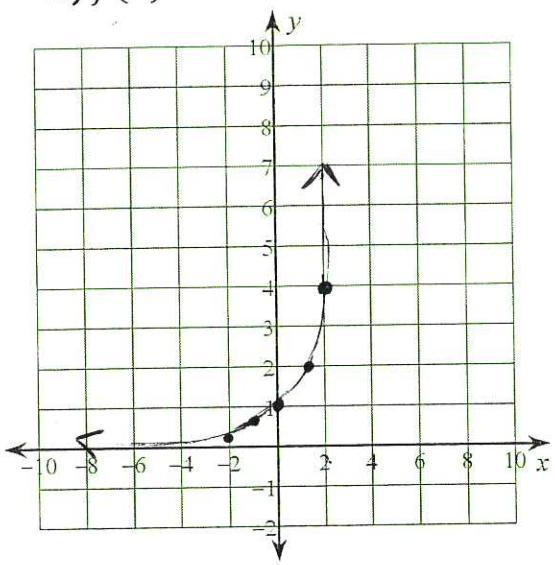
* gets close to zero (x-axis) but doesn't touch zero

Graphing Review:

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

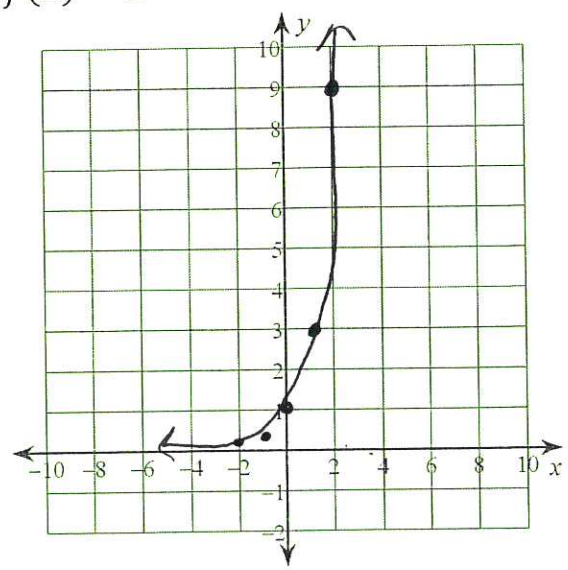
Examples:

1.) $f(x) = 2^x$



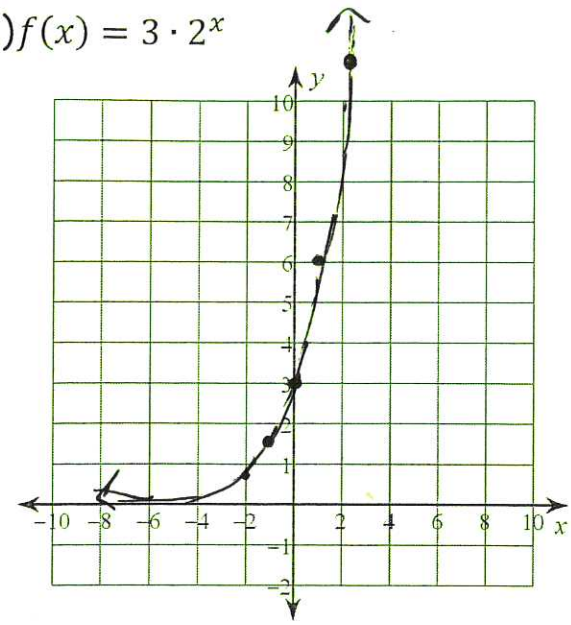
x	2^x	y
-2	$2^{-2} = \frac{1}{2^2}$	$\frac{1}{4} \approx .25$
-1	$2^{-1} = \frac{1}{2^1}$	$\frac{1}{2} \approx .5$
0	2^0	1
1	2^1	2
2	2^2	4

2.) $f(x) = 3^x$



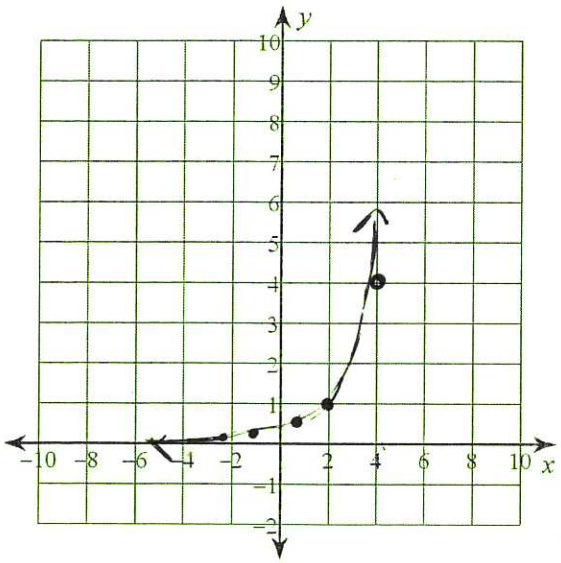
x	3^x	y
-2	$3^{-2} = \frac{1}{3^2}$	$\frac{1}{9} \approx .111$
-1	$3^{-1} = \frac{1}{3}$	$\frac{1}{3} = .333$
0	3^0	1
1	3^1	3
2	3^2	9

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



x	$3 \cdot 2^x$	y
−2	$3 \cdot 2^{-2} = \frac{3}{2^2} =$	$\frac{3}{4} \approx .75$
−1	$3 \cdot 2^{-1} = \frac{3}{2}$	$\frac{3}{2} \approx 1.5$
0	$3 \cdot 2^0 = 3 \cdot 1$	3
1	$3 \cdot 2^1 =$	6
2	$3 \cdot 2^2 = 3 \cdot 4$	12

4.) $f(x) = \frac{1}{4} \cdot 2^x$



x	$\frac{1}{4} \cdot 2^x$	y
−2	$\frac{1}{4} \cdot 2^{-2} = \frac{1}{4} \cdot \frac{1}{2^2}$	$\frac{1}{4} \cdot \frac{1}{4} = \frac{1}{16} \approx .0625$
−1	$\frac{1}{4} \cdot 2^{-1} = \frac{1}{4} \cdot \frac{1}{2}$	$\frac{1}{8} \approx .125$
0	$\frac{1}{4} \cdot 2^0 =$	$\frac{1}{4} \approx .25$
1	$\frac{1}{4} \cdot 2^1 = \frac{2}{4}$	$\frac{1}{2} \approx .5$
2	$\frac{1}{4} \cdot 2^2 = \frac{1}{4} \cdot 4$	1

★ 4 $\frac{1}{4} \cdot 2^4 = 4$

6 $\frac{1}{4} \cdot 2^6 = 16$