

Name: _____

Date: _____

Writing Exponential Equations

$$y = ab^x$$

$$a = \text{Start Value } (0) \text{ y-int.}$$

$$b = \text{Common Ratio (Right Left)}$$

**** It's a function when you start at 0...a Y-intercept****

1. Bacteria can multiply at an alarming rate when each bacteria splits into two new cells, thus doubling.

Hour	0	1	2	3	4	5	6	7	8	9	10	...	24
Bacteria	2	4	8	16	32	64	128	256	512	1024	2048	...	33554432

- a. Write an **equation** that represents this situation.

$$y = 2(2)^x$$

- b. How many bacteria will there be in 15 hours?

$$y = 2(2)^{15} = 65,536$$

2. Given the following table, write the **equation** that represents the information:

X	f(x)
-1	243
0	81
1	27
2	9

$$y = 81\left(\frac{1}{3}\right)^x$$

3. Each year the local country club sponsors a tennis tournament. Play starts with 128 participants. During each round, half of the players are eliminated.

Rounds	1	2	3	4
Number of Players left	64	32	16	8

- a. Write an **equation** for this scenario.

$$y = 128\left(\frac{1}{2}\right)^x$$

- b. When will there be 2 players left in the tournament?

$$\frac{1}{2} \quad \frac{2}{32} \quad \frac{3}{16} \quad \frac{4}{8} \quad \frac{5}{4} \quad \frac{6}{2}$$

Round 6

4. A colony of insects triples every day. If the colony has 80 insects today, how many will be present in 10 days?

$$y = 80(3)^{10} = 4,723,920$$

Graphing Exponential Functions

- Graph the special line called the asymptote
(Horizontal dashed line)
- Graph the curve. (Use your table function in your calculator)

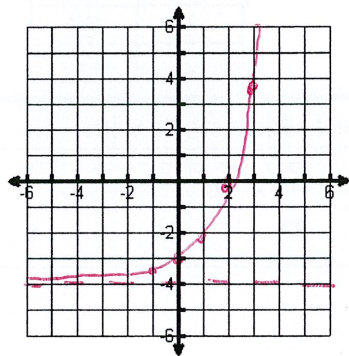
$$y = ab^{x-h} + k$$

Flat - Flat - Flat - Flat - zoom!

1. $y = (2)^x - 4$

Asymptote: $y = -4$

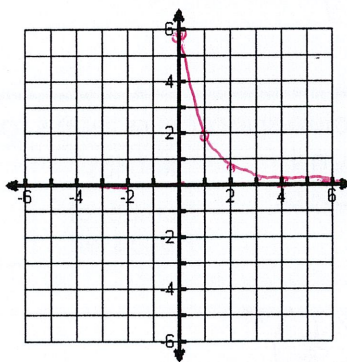
x	y
-1	-3.5
0	-3
1	-2
2	0
3	4



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

Asymptote: $y = 0$

x	y
0	6
1	2
2	$\frac{2}{3}$.67
3	$\frac{2}{9}$.22
4	$\frac{2}{27}$.07



3. $y = -(2)^x + 3$

Asymptote: $y = 3$

x	y
-1	2.5
0	2
1	1
2	-1
3	-5

