Exponential Functions

Name _____   Period _____

YouTube Video Questions:

1) There are 6 exponential functions in this video. What are they?

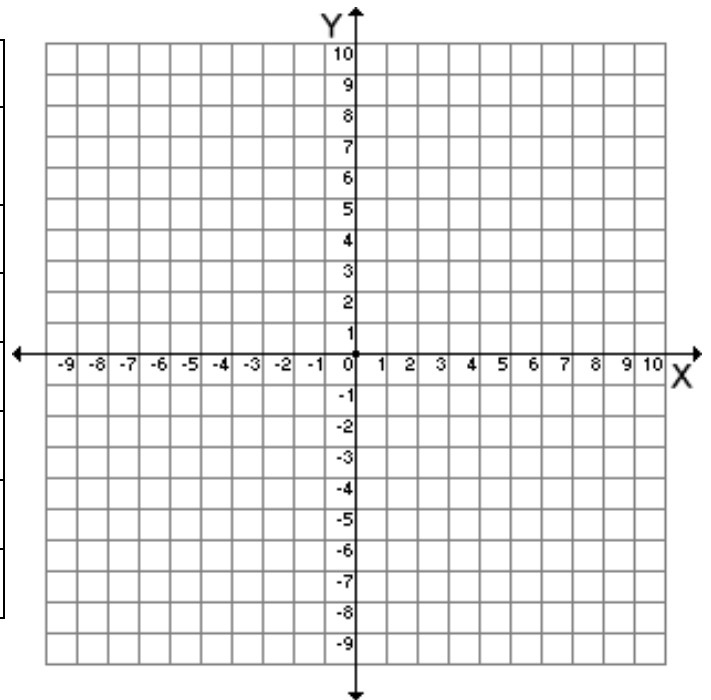2) For what value of the domain was each function evaluated in examples 1-4?

3) What are the two exponential functions that were graphed? What are their bases? What is the difference in the two bases?

Assignment - Hwk #15:

Ex 1: The function $y = 3^x$ is called an _____ function because the exponent is a
_____.

Now, let's look at how to graph the exponential function $y = 3^x$.

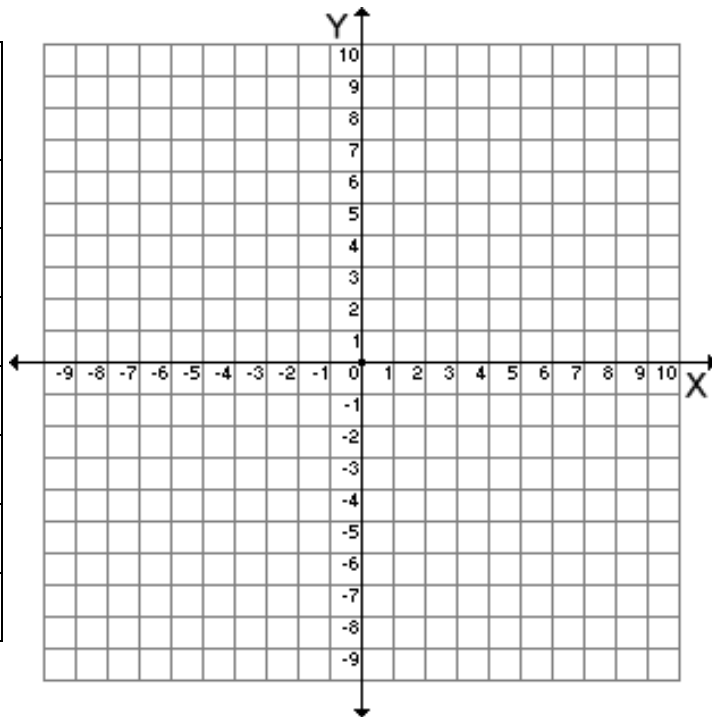| x	$y = 3^x$	y	(x, y)
-3	$y = 3^{(-3)} = \dfrac{1}{3^3} = \dfrac{1}{27}$		
-2			
-1			
0			
1			
2			
3			

Definition 1: Since the *y* values increase as the *x* values increase in the example above, this is what we call exponential
_____. (The graph goes up the hill from left to right)

QUESTION: In the exponential function $y = 3^x$, the y-values can never equal or be less than _____.

Ex 2: *Now, let's look at how to graph the exponential function* $y = \left(\dfrac{1}{3}\right)^x$.

x	$y = \left(\dfrac{1}{3}\right)^x$	y	(x, y)
-3			
-2			
-1			
0			
1			
2			
3			

Definition 2: Since the y values decrease as the x values increase in the example above, this is what we call exponential _____. (The graph goes down the hill from left to right)

Tell whether the functions below show exponential GROWTH or DECAY.

3) $y = \left(\dfrac{1}{4}\right)^x$

4) $y = 2^x$

5) $y = 1^x$

6) $y = 5^x$

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

8) $y = 9^x$

9) $y = \left(\dfrac{1}{5}\right)^x$

10) $y = 4^x$

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

12) $y = \left(\dfrac{5}{6}\right)^x$

a. Which function will have the steepest exponential growth?

b. Which function will have the flattest exponential growth?

c. Which function will have the steepest exponential decay?

d. Which function will have the flattest exponential decay?