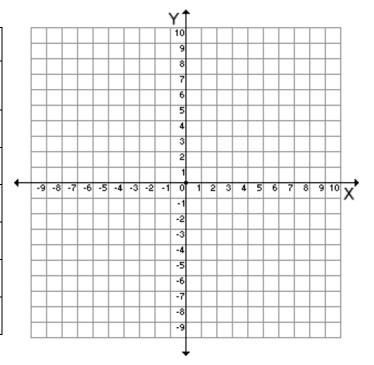
Graphing Exponential Functions

Name	Period #
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	$y = 3^x$	У	(x, y)
-3	$y = 3^{(-3)} = \frac{1}{3^3} = \frac{1}{27}$		
-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 _____.

<u>**Definition 2**</u>: Since the y-value can NEVER equal zero in this function, there is a horizontal at y = 0.

Ex 2: By looking at the graph above, list the domain and range of the function $y = 3^x$

DOMAIN:

RANGE:

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

				_				,	,			Υ	Ť									
x	$y = \left(\frac{1}{3}\right)^x$	У	(x,y)									10 9 8										
-3												5								\exists	_	
-2										-		3								_	+	
-1				 	9 -	8 -7	' -6	-5	-4	-3	-2	1 0	1	2	3	4	5	6	7	8	9	10
0												-2									_]
1					+					1	+	-3 -4 -5								\dashv	\perp	
					+	+	\vdash	Н	+	+	+	-6					\dashv	\dashv	\dashv	\dashv	+	\dashv
2					+	+	\vdash	Н	+	+	+	-7		Н		Н	\dashv	\dashv	\dashv	\dashv	\dashv	\dashv
3									+												-	

Definition 3: 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)

QUESTION: Is there an asymptote? If so, where is it?

Ex 4: By looking at the graph above, list the domain and range of the function $\mathcal{Y} = \left(\frac{1}{3}\right)^x$

DOMAIN:

RANGE:

Tell whether the functions below show exponential GROWTH or DECAY.

$$5) \quad y = \left(\frac{1}{4}\right)^x$$

$$6) \quad y = 2^x$$

7)
$$y = 1^x$$

8)
$$y = 5^x$$

$$9) \quad y = 0^x$$

10)
$$y = \left(\frac{2}{3}\right)^x$$

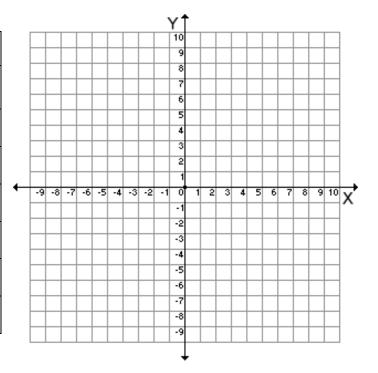
Graphing Exponential Functions Practice Worksheet

Name _____ Period # _____

Graph the following functions and tell whether they show exponential growth or decay.

1)

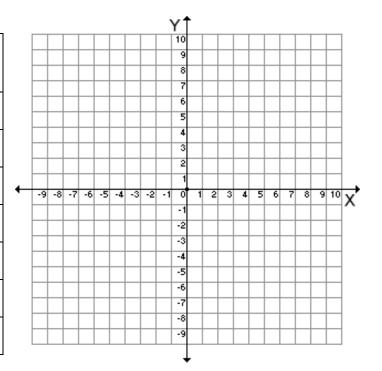
X	$y = 2^x$	У	(x, y)
-3			
-2			
-1			
0			
1			
2			
3			



Does the function above show exponential GROWTH or DECAY?

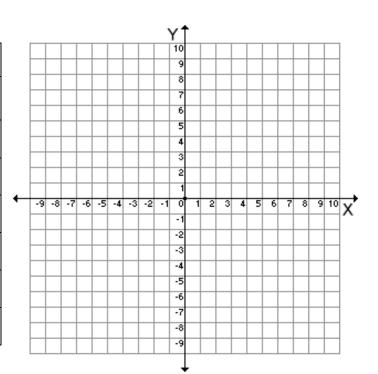
2)

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



3)

X	$y = 1^x$	y	(x, y)
-3			
-2			
-1			
0			
1			
2			
3			



Does the function above show exponential GROWTH or DECAY?

Tell whether the functions below show exponential GROWTH or DECAY.

$$4) \quad y = 9^x$$

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

$$6) \quad y = 4^x$$

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

$$8) \quad y = \left(\frac{5}{6}\right)^x$$

$$9) \quad y = 0^x$$

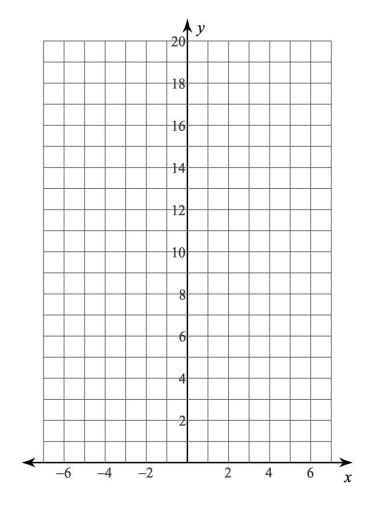
Graphing Exponential Functions Worksheet #2

<u>Directions</u>: Answer all questions. Show all work!!!

Sketch the graph of each function. Then, state the Domain, Range, and Y-intercept, and change of Y-values of the function.

1. $y = 8 \cdot (\frac{1}{2})^x$

	,
X	Y
-1	
0	
1	
2	
3	
4	
5	
6	



Domain:

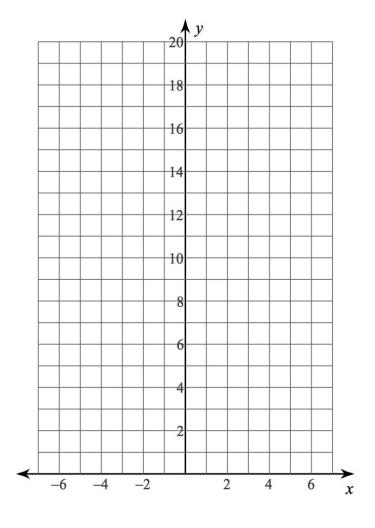
Range:

Y-Intercept: (,)

Change in Y-Values:

 $2. \quad y = \frac{7}{2} \cdot 2^x$

X	Y
-4	
-3	
-2	
-1	
0	
1	
2	
3	
4	



Domain:

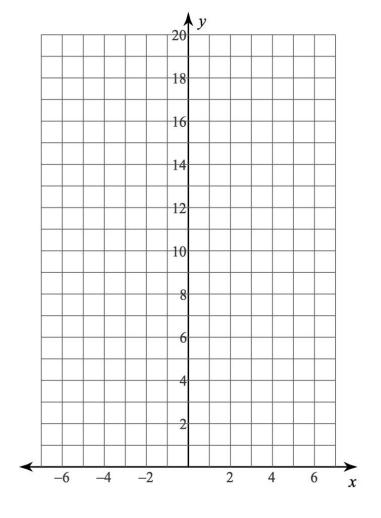
Range:

Y-Intercept: (,)

Change in Y-Values:

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

X	Y
-2	
-1	
0	
1	
2	
3	
4	
5	
6	
7	



Domain:

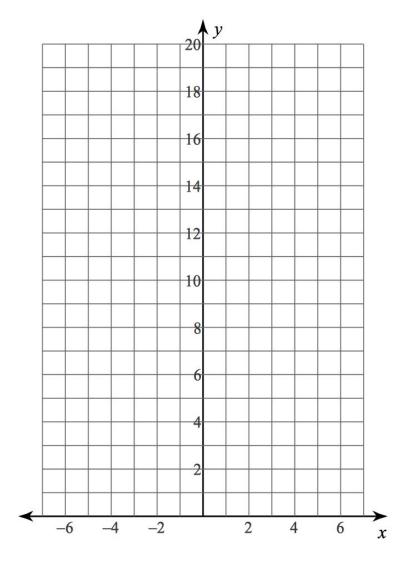
Range:

Y-Intercept: (,)

Change in Y-Values:

4. $y = 0.5^x$

X 7
Y



Domain:

Range:

Y-Intercept: (,)

Change in Y-Values (b):