Unit 4-Exponential Functions

Finding Exponential Models Day 5 Notes and Class Work

Name:	
Date:	Hour

Example 1: Write an exponential function $y = ab^x$ for a graph that includes the given points.

(2, 4), (3, 16)

Step 1: Write the formula for an exponential function.

- Step 2: Write the exponential function using the ordered pair with the larger "x".
- Step 3: Write the exponential function using the other ordered pair.
- Step 4: Divide the two equations and simplify to find "b".
- Step 5: Pick one of the ordered pairs and the "b" value found in Step 4 to find "a".
- Step 6: Write the exponential function using the "a" and "b" values.

Example 2: Write an exponential function $y = ab^x$ for the data in the table.

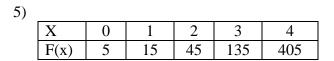
Х	0	1	2	3
f(x)	4	2	1	1/2

When there is a common ratio between the y values the function is exponential.

<u>Class Work</u>: Find the exponential model for each of the following.

1) (0, 2) and (3, 250)

2) (3, 2048) and (5, 131072)



6)

Х	3	4	5	6	7
F(x)	13.5	20.25	30.375	45.5625	68.34375

Unit 4-Exponential Functions Finding Exponential Models Day 5 Worksheet

Name:_	
Date:	Hour

In exercises 1-6, write an exponential function <i>y</i>	ab^x for a graph that includes the given points.
1. (2, 122.5), (3, 857.5)	2. (-3, 24), (-2, 12)

2. (-3, 24), (-2, 12)

3. 2,16 , 4, 2.56

4. 4, 8 , 6, 32

5.

Х	2	4	6	7	9
F(x)	96	1536	24576	98304	1572864

6. A pharmaceutical company is testing a new anesthetic. They injected 14 mg of the anesthetic into the bloodstream of a laboratory rat and then monitored the level of the drug every hour. The results are in the table below. (Hint: Round each of the ratios to two decimal places)

Time (hr)	0	1	2	3	4	5	6	7	8	9
Anesthetic (mg)	14.00	9.38	6.28	4.21	2.82	1.89	1.27	.85	.57	.38

7. *Multiple choice*. For which set of data below is an exponential model most appropriate? *Explain*.

a.	x	0	1	2	3	4	5	6
	y	3	18	75	390	1800	10,000	50,000
	<u> </u>							
b.	x	0	1	2	3	4	5	6
	y	3	15	75	375	1875	9375	46875
c.	x	0	1	2	3	4	5	6
	y	3	6	99	732	3075	9378	23331

- 8. Suppose (0, 4) and (2, 36) are on the graph of an exponential function.
 - **a.** Use (0, 4) in the general form of an exponential function $y = a \cdot b^x$ to find the value of the constant *a*.
 - **b.** Use your answer from part (a) along with (2, 36) to find the value of the constant *b*.
 - c. Write a rule for the function.
 - **d.** Evaluate the function for x = -2 and x = 4.