

Name _____

Hour _____

Review 7.1-7.2: Exponential Growth and Exponential Decay ($y = bg^x$)

(Don't have to do this in hmwk notebook / This is due Monday)

1. Write the following expressions using exponents:

A.) $25 \cdot x \cdot x \cdot x$

$25x^3$

B.) $6 \cdot a \cdot a \cdot a \cdot a \cdot a \cdot b \cdot b \cdot b$

$6a^5b^3$

2. Evaluate to the nearest thousandth (3 decimal places!)

A.) 135^5

4.484×10^{10}

B.) $40(1 + .06)^{10}$

71.634

3. Evaluate the expressions:

A.) $8^0 \cdot 8^2$

64

B.) $(a + 15)^0$ when $a = 6$

1

C.) $400 \cdot 3^n$ when $n = 0$

400

4. A colony of bacteria doubles every 6 hours. How many times will it double

A.) in 24 hours?

4

B.) in 5 days?

20

C.) in 2 weeks?

64

5. Anna has started a new job paying \$8 per hour. Assuming that her work is excellent, she will get a 5% raise every 4 months.

A.) After 3 years, how many raises will she have gotten?

9

B.) What will her pay rate be after 3 years?

$$8(1.05)^9 = \$12.41$$

C.) If her employer continues to give her raises in this way, what will her pay rate be after she has been working for 10 years?

$$8(1.05)^{30} = \$34.58$$

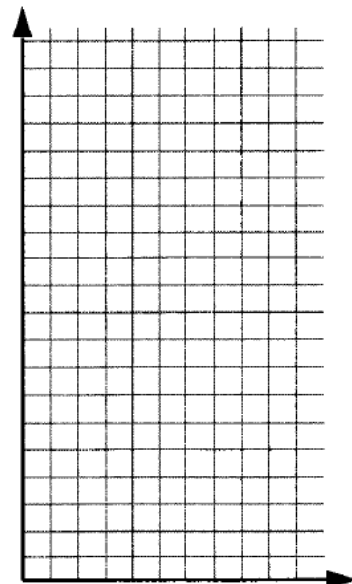
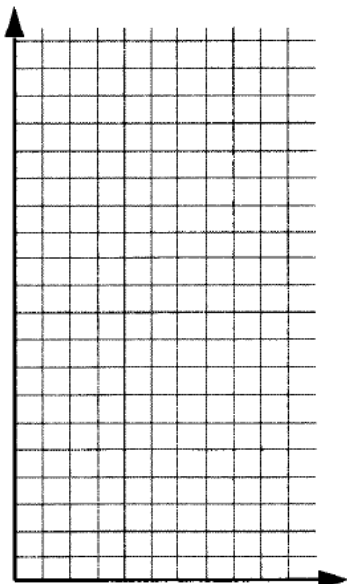
First label each equation as Exponential Growth or Exponential Decay. Then, make a table of values to graph the following. Let $x = 0, 1, 2, 3,$ and 4 . Choose an appropriate scale for the y -axis. (Count by 1's on the x -axis).

6. $y = 2 \cdot 4^x$

| x | y |
|---|-----|
| 0 | 2 |
| 1 | 8 |
| 2 | 32 |
| 3 | 128 |
| 4 | 512 |

7. $y = 50 \cdot (0.2)^x$

| x | y |
|---|---|
| | |
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Directions (8-11): Read each problem below to determine if the situation described is exponential growth or exponential decay (circle one). Write the equation that models the situation and use your equation to answer the question.

8. The population of South America is growing at a rate of 2.4% per year. If the 1990 population was 307 million people, and the growth rate continues, what will the population of South America be in 2006? Exponential Growth / Exponential Decay

$$307(1.024)^{16} = 449 \text{ million ppl.}$$

9. You have a sandcastle that is 30 inches tall. It is raining, and every 15 minutes 18% of your sandcastle height is being washed away. How tall will your castle be, if it rains for an hour and a half? Exponential Growth / Exponential Decay

$$30(.82)^6 = 9.12 \text{ in.}$$

10. A landfill has 100 million tons of garbage in it. Each decade, 10% of the garbage decomposes. How much garbage will there be after 40 years? Exponential Growth / Exponential Decay

$$100(.9)^4 = 65.61 \text{ million tons}$$

11. A stereo has a sound level of 100 decibels. For every 50 feet you move away from the stereo, the sound is half as loud. If you move 200 feet from the stereo, what is the decibel level? Exponential Growth / Exponential Decay

$$100(.5)^4 = 6.25 \text{ decibels}$$