Name: _____

Unit 2 – Test Review

1. A house that costs $200,000 will appreciate in value by 3% each year.

    a. Write a function that models the cost of the house over time.

    b. Find the value of the house at the end of ten years.

    c. How many years will it take for the house to be valued at $300,000?

2. The flu virus spreads very quickly! On the first day of the illness, only 2 virus "bugs" are present. Each day after, the amount of "bugs" triples.

    a. Write a function that models the "bug's" growth over time.

    b. Find the amount of "bugs" present by the 5th day.

    c. How quickly does the virus spread to 1000 cases?

3. Tobias ate half a banana in his room and forgot to throw the rest away. That night, two gnats came to visit the banana. Each night after, there were four times as many gnats hanging around the banana.

    a. Write a function that models the gnats' growth over time. .

    b. Tobias' mom said that he will be grounded if the gnats exceed 120. On what night will Tobias be in trouble, if he doesn't step in and solve the gnat problem?

4. You have a bad cough and have to attend your little sister's choir concert. You take cough drops that contain 100 mg of menthol in each drop. Every minute, the amount of menthol in your body is cut in half.

    a. Write a function that models the amount of menthol in your body over time.

    b. It is safe to take a new cough drop after the level of menthol in your body is less than 5 mg. How long will it be before you can take another cough drop?

5. Josiah is 60 inches and going through a growth spurt. For the next year, his growth will increase by 1% each month.

    a. Write a function that models Josiah's growth spurt over the next year.

    b. Find Josiah's height after one year.

6. Ian's new Mercedes cost him $75,000. From the moment he drives it off the lot, it will depreciate by 20% each year for the first five years.

    a. Write a function that models the car's depreciation.

    b. What will the car's value be at the end of five years?

7. Convert the following exponential equations to logarithmic equations. DO NOT SOLVE!
    a. $9^4 = 6561$

    b. $5^{1/4} = 1/625$

    c. $m^4 = 10{,}000$

    d. $x^{1/2} = y$

8. Convert the following logarithmic equations to exponential equations. DO NOT SOLVE!
    a. $\log_{125}(5) = \frac{1}{3}$

    b. $\log_6\left(\frac{1}{1296}\right) = -4$

    c. $\log_8(512) = 3$