Lesson 9 Practice Problems

1. For each equation in the left column, find in the right column an exact or approximate value for the unknown exponent so that the equation is true.

   A. $10^y = 10$ 1. 0.602

   B. $10^y = 20$ 2. -1

   C. $10^y = 2,000$ 3. 1

   D. $10^y = 900$ 4. 2.954

   E. $10^y = 4$ 5. 1.301

                                                          6. 3.301

                                                          7. 1.999

2. Here is a logarithmic expression: $\log_{10} 100$.

   a. How do we say the expression in words?

   b. Explain in your own words what the expression means.

   c. What is the value of this expression?

3. The base 10 log table shows that the value of $\log_{10} 50$ is about 1.69897. Explain or show why it makes sense that the value is between 1 and 2.

4. Here is a table of some logarithm values.

   a. What is the approximate value of $\log_{10}(400)$?

   b. What is the value of $\log_{10}(1000)$? Is this value approximate or exact? Explain how you know.

| x	$\log_{10}(x)$
200	2.3010
300	2.4771
400	2.6021
500	2.6990
600	2.7782
700	2.8451
800	2.9031
900	2.9542
1,000	3

5. What is the value of $\log_{10}(1{,}000{,}000{,}000)$? Explain how you know.

6. A bank account balance, in dollars, is modeled by the equation $f(t) = 1{,}000 \cdot (1.08)^t$, where t is time measured in years.

   About how many years will it take for the account balance to double? Explain or show how you know.

   (From Unit 4, Lesson 8.)

7. The graph shows the number of milligrams of a chemical in the body, d days after it was first measured.
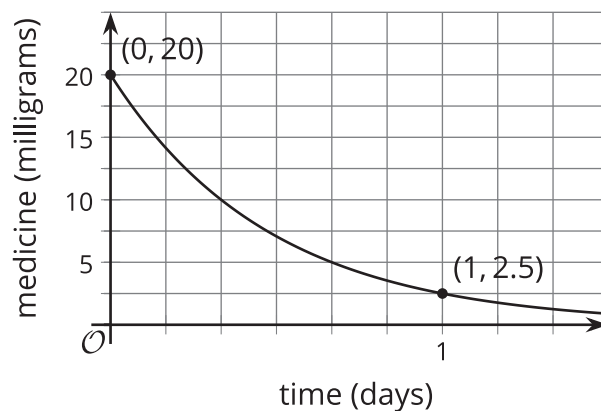
a. Explain what the point $(1, 2.5)$ means in this situation.

b. Mark the point that represents the amount of medicine left in the body after 8 hours.

(From Unit 4, Lesson 3.)

8. The exponential function f takes the value 10 when $x = 1$ and 30 when $x = 2$.

a. What is the y-intercept of f? Explain how you know.

b. What is an equation defining f?

(From Unit 4, Lesson 6.)