Lesson 11 Practice Problems

1. Select **all** expressions that are equal to $\log_2 8$.

   A. $\log_5 20$

   B. $\log_5 125$

   C. $\log_{10} 100$

   D. $\log_{10} 1{,}000$

   E. $\log_3 27$

   F. $\log_{10} 0.001$

2. Which expression has a greater value: $\log_{10} \frac{1}{100}$ or $\log_2 \frac{1}{8}$? Explain how you know.

3. Andre says that $\log_{10}(55) = 1.5$ because 55 is halfway between 10 and 100. Do you agree with Andre? Explain your reasoning.

4. An exponential function is defined by $k(x) = 15 \cdot 2^x$.

    a. Show that when x increases from 1 to 1.25 and when it increases from 2.75 to 3, the value of k grows by the same factor.

    b. Show that when x increases from t to $t + 0.25$, $k(t)$ also grows by this same factor.

(From Unit 4, Lesson 5.)

5. How many times does \$1 need to double in value to become \$1,000,000? Explain how you know.

(From Unit 4, Lesson 8.)

6. What values could replace the "?" in these equations to make them true?

    a. $\log_{10} 10{,}000 = ?$

    b. $\log_{10} 10{,}000{,}000 = ?$

    c. $\log_{10} ? = 5$

    d. $\log_{10} ? = 1$

(From Unit 4, Lesson 9.)

7. a. What value of t would make the equation $2^t = 6$ true?

b. Between which two whole numbers is the value of $\log_2 6$? Explain how you know.

8. For each exponential equation, write an equivalent equation in logarithmic form.

a. $3^4 = 81$

b. $10^0 = 1$

c. $4^{\frac{1}{2}} = 2$

d. $2^t = 5$

e. $m^n = C$