Lesson 14 Practice Problems

1. Solve each equation without using a calculator. Some solutions will need to be expressed using log notation.

   a. $4 \cdot 10^x = 400{,}000$

   b. $10^{(n+1)} = 1$

   c. $10^{3n} = 1{,}000{,}000$

   d. $10^p = 725$

   e. $6 \cdot 10^t = 360$

2. Solve $\frac{1}{4} \cdot 10^{(d+2)} = 0.25$. Show your reasoning.

3. Write two equations—one in logarithmic form and one in exponential form—that represent the statement: "the natural logarithm of 10 is y".

4. Explain why $\ln 1 = 0$.

5. If $\log_{10}(x) = 6$, what is the value of x? Explain how you know.

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

   a. $\log_2 16 = 4$

   b. $\log_3 9 = 2$

   c. $\log_5 5 = 1$

   d. $\log_{10} 20 = y$

   e. $\log_2 30 = y$

7. The function f is given by $f(x) = e^{0.07x}$.

   a. What is the continuous growth rate of f?

   b. By what factor does f grow when the input x increases by 1?