Unit 2 Test Prep

1. Use the exponential function to answer the following questions.

$$f(x) = 12(0.96)^x$$

   a) Find f(6) and round to 2 decimal places

   b) What is the initial value

   c) What is the base value

   d) Is the exponential function growing or decaying

2. Axel invested $480 into a bank account at an interest rate of 8% compounded quarterly. How much money does she have after 7 years?

   a. $355.69
   b. $822.64
   c. $189.31
   d. $835.69

3. The population P(t) of bacteria in a petry dish is modeled by the following equation where t measures in hours since the population study began.

$$P(t) = \frac{1200}{1 + 11 \text{ x } 1.7^{-t}}$$

a. What is the carrying capacity?

b. What is the initial population of bacteria?

c. What is the population of bacteria after 4 years?

4. Change the equation to logarithmic form

$$6^{3x} = 36$$

5. Change the equation to exponential form

$$\log(x - 3) = 2$$

6. Solve the equation algebraically. Round the answer to 4 decimal places

$$4(3^x) + 10 = 90$$

Solution:

7. Solve the following algebraically. Round to 2 decimal places

$$2\log_e(x) + 5 = 19$$

Solution:

8. Solve the following algebraically. Round to 4 decimal places

$$5\log_2(3x) - 7 = 15$$

Solution:

9. Expand the expression. If possible, write the answer without exponents

$$\ln \frac{m^3 x^2}{5}$$

10. Combine the expression. If possible, write the answer without exponents

$$\text{Log}(x^2) + \text{Log}(5x) - \text{Log}(6)$$

11. Solve the equation using log properties.

$$\log_3(x + 8) = 2 - \log_3 x$$

12. Solve the equation using log properties.

$$2\log a = \log(7a + 18)$$

13. The formula $C(x) = 280 \ln(x + 1) + 1925$ models the number of calories consumed by a person owning x acres of land.

a. How many calories daily would a person consume if they owned 1.5 acres of land?

b. Estimate the number of acres owned for which the average intake is 2300 calories per day.