2-4 Lesson Master

**PROPERTIES**

Objective E

1. **Multiple choice.** Which of the following equations models exponential decay?
   
   a) \( f(x) = -3(1.7)^x \)  
   b) \( f(x) = 3(-1.7)^x \)  
   c) \( f(x) = -3(0.7)^x \)  
   d) \( f(x) = 3(0.7)^x \)

2. Find the values of \( a \) and \( b \) in the exponential function \( f(x) = ab^x \) graphed at the right.

3. Let \( f \) and \( g \) be defined by \( f(x) = 2^x \) and \( g(x) = 3^x \).
   
   a. Without graphing, which function has greater values when \( x > 0 \)?
   b. Without graphing, which function has greater values when \( x < 0 \)?

4 and 5. An equation for a function \( f \) is given.
   
   a. State the function’s domain  
   b. State the function’s range.

4. \( f(x) = 0.47(11.3^x) \)
   
   a. ___________  
   b. ___________

5. \( f(x) = 5(0.82^x) \)
   
   a. ___________  
   b. ___________

In 6–9, consider an exponential function given by the equation \( f(x) = ab^x \), where \( a \neq 0 \), \( b > 0 \), and \( b \neq 1 \). True or false.

6. If \( b = \frac{1}{3} \), then the graph of the function never crosses the \( x \)-axis. ___________

7. If \( b = \frac{1}{3} \), then the graph of the function never crosses the \( y \)-axis. ___________

8. If \( a = 0.7 \) and \( b = 2 \), then \( f \) is strictly decreasing. ___________

9. If \( a = 1.82 \) and \( b = 0.35 \), then \( f \) is strictly decreasing. ___________

10. Explain why no exponential function \( f: x \rightarrow ab^x \) contains the points \((0, 1), (1, 3)\), and \((2, 10)\). ___________


**Questions on SPUR Objectives**

See pages 146–149 for objectives.