Name

9-1B Lesson Master

Questions on SPUR Objectives
See Student Edition pages 656–659 for objectives.

VOCABULARY

1. Write the general equation for an *exponential function* and give the restrictions, if any, for each variable.

PROPERTIES Objective D

2. Determine whether each equation is an exponential function.

   a. $f(x) = 3 \cdot 7^x$ _____

   b. $f(x) = x^{3.7}$ _____

   c. $f(x) = 3.7^x$ _____

   d. $f(x) = 3(7)^x$ _____

In 3 and 4, an equation for a function is given. a. Give the domain of the function. b. Give the range of the function.

3. $f(x) = 9^x$ a. _____ b. _____

4. $f(x) = 3(1.05)^x$ a. _____ b. _____

Fill in the Blanks **In 5–7, suppose you are to model a situation with an initial value of 1500 and a growth rate of 7.5%.**

5. If $A = P(1 + r)^t$, then $P =$ _____ and $r =$ _____.

6. If $g_n = g_1 r^{n-1}$, then $g_1 =$ _____ and $r =$ _____.

7. If $y = a \cdot b^x$, then $a =$ _____ and $b =$ _____.

USES Objective G

8. The population N of a certain strain of bacteria grows according to the equation $N = 200 \cdot 2^{1.4t}$, where t is the time in hours.

   a. How many bacteria were there at the beginning of the experiment? _____

   b. After how many hours will the number of bacteria double? _____

   c. Estimate the number of bacteria in 10 hours. _____

   d. Estimate the number of bacteria 2 hours before the experiment began. _____

9. In 2004, the number of weekly passes sold by Tri-Cities Transit was 98,481 and was growing at a rate of about 3.8% per year. At this rate, estimate the number of passes sold in each year.

   a. 2007 _____ b. 1995 _____

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10. Florida's population grew from about 1.9 million in 1940 to almost 16 million in 2000. That is an increase of about 742% in just 60 years. Of the American cities with populations over 100,000, Port St. Lucie, FL, had the fastest growth rate from July, 2003 to July, 2004. In 2003, its population was about 105,707. In 2004, it was about 118,396. Assume that the growth rate continues.

    a. By what percent did the population of Port St. Lucie increase from July, 2003 to July, 2004? Round to the nearest percent. _____

    b. What was the growth factor for the year? _____

    c. Let $P(x)$ = the estimated population x years after 2003. Find a formula for $P(x)$. _____

    d. Estimate the population of Port St. Lucie in 2010. _____

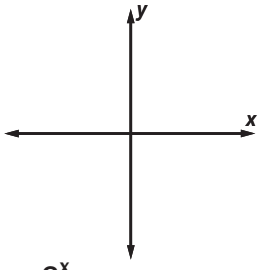
    e. Use the function $P(x)$ from Part c to estimate the year during which the population will reach a half million. _____

REPRESENTATIONS Objective J

11. **Multiple Choice** Which equation has a graph that is an exponential curve? _____

    A $y = 4x$ B $y = x^4$ C $y = 4^x$ D $y = \frac{x}{4}$

12. At the right, sketch a graph that could represent exponential growth.



In 13 and 14, consider the functions f and g with $f(x) = 0.25 \cdot 3^x$ and $g(x) = 3^x$.

13. Fill in the table of values below.

x	$f(x) = 0.25 \cdot 3^x$	$g(x) = 3^x$
–1.5		
–1		
0		
1		
1.5		

14. Carefully graph and label both functions on the same set of axes below.