

**LESSON  
MASTER****9-1  
B****Questions on SPUR Objectives****Vocabulary**

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

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**Properties** Objective D: Recognize properties of exponential functions.

In 2 and 3, an equation for a function is given. a. Give the domain of the function. b. Give the range of the function.

2.  $f(x) = 9^x$

3.  $f(x) = 3(1.05)^x$

a. \_\_\_\_\_

a. \_\_\_\_\_

b. \_\_\_\_\_

b. \_\_\_\_\_

**Uses** Objective F: Apply exponential-growth models.

4. 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. \_\_\_\_\_

5. In 1994, 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. 1997 \_\_\_\_\_

b. 1985 \_\_\_\_\_

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6. Of the American cities with populations over 100,000, Mesa, Arizona, had the fastest growing population for the decade from 1980 to 1990. In 1980, its population was 152,404. In 1990, it was 288,091. Assume that the growth rate continues.

- a. By what percent did the population of Mesa increase in the decade from 1980 to 1990? Round to the nearest percent. \_\_\_\_\_
- b. What was the growth rate for the decade? \_\_\_\_\_
- c. Let  $P(x)$  = the population  $x$  decades after 1980. Find a formula for  $P(x)$ . \_\_\_\_\_
- d. Estimate the population of Mesa in 2010. \_\_\_\_\_
- e. Use the function  $P(x)$  from part c to:
  - (i) estimate the year during which the population was 200,000. \_\_\_\_\_
  - (ii) estimate the year during which the population will reach a half million. \_\_\_\_\_

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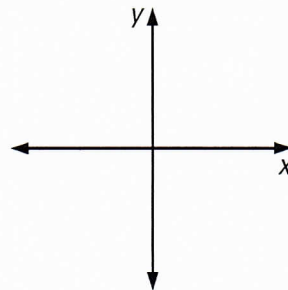
**Representations** Objective I: Graph exponential functions.

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7. *Multiple choice.* Which equation has a graph that is an exponential curve?

- (a)  $y = 4x$       (b)  $y = x^4$       (c)  $y = 4^x$       (d)  $y = \frac{x}{4}$       \_\_\_\_\_

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



9. Locate at least five points on the graph of  $y = .25 \cdot 3^x$  on the grid at the right.

