

7.2 EXERCISES

HOMWORK KEY

 = **WORKED-OUT SOLUTIONS**
on p. WS1 for Exs. 9, 19, and 33

 = **TAKS PRACTICE AND REASONING**
Exs. 15, 27, 28, 33, 35, 37, and 38

SKILL PRACTICE

- VOCABULARY** In the exponential decay model $y = 1250(0.85)^t$, identify the initial amount, the decay factor, and the percent decrease.
- WRITING** Explain how to tell whether the function $y = b^x$ represents exponential growth or exponential decay.

CLASSIFYING FUNCTIONS Tell whether the function represents *exponential growth* or *exponential decay*.

- $f(x) = 3\left(\frac{3}{4}\right)^x$
- $f(x) = 4\left(\frac{5}{2}\right)^x$
- $f(x) = \frac{2}{7} \cdot 4^x$
- $f(x) = 25(0.25)^x$

EXAMPLES 1 and 2

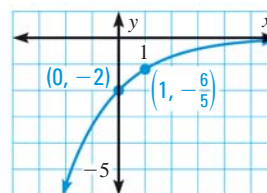
on pp. 486–487
for Exs. 7–15

GRAPHING FUNCTIONS Graph the function.

- $y = \left(\frac{1}{4}\right)^x$
- $y = \left(\frac{1}{3}\right)^x$
- $f(x) = 2\left(\frac{1}{5}\right)^x$
- $y = -(0.2)^x$
- $y = -4\left(\frac{1}{3}\right)^x$
- $g(x) = 2(0.75)^x$
- $y = \left(\frac{3}{5}\right)^x$
- $h(x) = -3\left(\frac{3}{8}\right)^x$

- MAKE REASONING** The graph of which function is shown?

- A $y = 2\left(-\frac{3}{5}\right)^x$ B $y = -2\left(\frac{3}{5}\right)^x$
 C $y = -2\left(\frac{2}{5}\right)^x$ D $y = 2\left(-\frac{2}{5}\right)^x$



EXAMPLE 3

on p. 487
for Exs. 16–25

TRANSLATING GRAPHS Graph the function. State the domain and range.

- $y = \left(\frac{1}{3}\right)^x + 1$
- $y = -\left(\frac{1}{2}\right)^{x-1}$
- $y = 2\left(\frac{1}{3}\right)^{x+1} - 3$
- $y = \left(\frac{2}{3}\right)^{x-4} - 1$
- $y = 3(0.25)^x + 3$
- $y = \left(\frac{1}{3}\right)^{x-2} + 2$
- $f(x) = -3\left(\frac{1}{4}\right)^{x-1}$
- $g(x) = 6\left(\frac{1}{2}\right)^{x+5} - 2$
- $h(x) = 4\left(\frac{1}{2}\right)^{x+1}$

- GRAPHING CALCULATOR** Consider the exponential decay function $y = ab^{x-h} + k$ where $a = 3$, $b = 0.4$, $h = 2$, and $k = -1$. Predict the effect on the function's graph of each change in a , b , h , or k described in parts (a)–(d). Use a graphing calculator to check your prediction.

- a. a changes to 4 b. b changes to 0.2
 c. h changes to 5 d. k changes to 3

- ERROR ANALYSIS** You invest \$500 in the stock of a company. The value of the stock decreases 2% each year. Describe and correct the error in writing a model for the value of the stock after t years.

$$y = \left(\begin{array}{l} \text{Initial} \\ \text{amount} \end{array} \right) \left(\begin{array}{l} \text{Decay} \\ \text{factor} \end{array} \right)^t$$

$$y = 500(0.02)^t$$

