



GUIDED PRACTICE

1. **Vocabulary** Tell whether $y = 3x^4$ is an *exponential function*. Explain your answer.

SEE EXAMPLE 1

2. **Physics** The function $f(x) = 50,000(0.975)^x$, where x represents the underwater depth in meters, models the intensity of light below the water's surface in lumens per square meter. What is the intensity of light 200 meters below the surface? Round your answer to the nearest whole number.

SEE EXAMPLE 2

Tell whether each set of ordered pairs satisfies an exponential function. Explain your answer.

3. $\{(-1, -1), (0, 0), (1, -1), (2, -4)\}$

4. $\{(0, 1), (1, 4), (2, 16), (3, 64)\}$

Graph each exponential function.

SEE EXAMPLE 3

5. $y = 3^x$

6. $y = 5^x$

7. $y = 10(3)^x$

8. $y = 5(2)^x$

SEE EXAMPLE 4

9. $y = -2(3)^x$

10. $y = -4(2)^x$

11. $y = -3(2)^x$

12. $y = 2(3)^x$

SEE EXAMPLE 5

13. $y = -\left(\frac{1}{4}\right)^x$

14. $y = \left(\frac{1}{3}\right)^x$

15. $y = 2\left(\frac{1}{4}\right)^x$

16. $y = -2(0.25)^x$

SEE EXAMPLE 6

17. The function $f(x) = 57.8(1.02)^x$ gives the number of passenger cars, in millions, in the United States x years after 1960. Using this model, in about what year does the number of passenger cars reach 200 million?

PRACTICE AND PROBLEM SOLVING

Independent Practice

For Exercises	See Example
18–20	1
21–24	2
25–27	3
28–30	4
31–33	5
34	6



18. **Sports** If a golf ball is dropped from a height of 27 feet, the function $f(x) = 27\left(\frac{2}{3}\right)^x$ gives the height in feet of each bounce, where x is the bounce number. What will be the height of the 4th bounce?

19. Suppose the depth of a lake can be described by the function $y = 334(0.976)^x$, where x represents the number of weeks from today. Today, the depth of the lake is 334 ft. What will the depth be in 6 weeks? Round your answer to the nearest whole number.

20. **Physics** A ball rolling down a slope travels continuously faster. Suppose the function $y = 1.3(1.41)^x$ describes the speed of the ball in inches per minute. How fast will the ball be rolling in 15 minutes? Round your answer to the nearest hundredth.

Tell whether each set of ordered pairs satisfies an exponential function. Explain your answer.

21. $\{(-2, 9), (-1, 3), (0, 1), (1, \frac{1}{3})\}$

22. $\{(-1, 0), (0, 1), (1, 4), (2, 9)\}$

23. $\{(-1, -5), (0, -3), (1, -1), (2, 1)\}$

24. $\{(-3, 6.25), (-2, 12.5), (-1, 25), (0, 50)\}$