## **CHAPTER TEST**

Simplify the expression. Write your answer using exponents.

1. $(62 \cdot 17)^4$	<b>2.</b> $(-3)(-3)^6$	<b>3.</b> $\frac{8^4 \cdot 8^5}{8^3}$	<b>4.</b> $(8^4)^3$
5. $\frac{2^{15}}{2^8}$	<b>6.</b> $5^3 \cdot 5^0 \cdot 5^5$	<b>7.</b> $[(-4)^3]^2$	8. $\frac{(-5)^{10}}{(-5)^3}$

## Simplify the expression.

- **9.**  $t^2 \cdot t^6$  **10.**  $\left(\frac{s}{t}\right)^6$  **11.**  $\frac{1}{9^{-2}}$  **12.**  $-(6p)^2$
- **13.**  $(5xy)^2$  **14.**  $\frac{1}{z^7} \cdot z^9$  **15.**  $(x^5)^3$  **16.**  $\left(-\frac{4}{c}\right)^2$

## Simplify the expression. Write your answer using only positive exponents.

**17.** 
$$\left(\frac{a^{-3}}{3b}\right)^4$$
 **18.**  $\frac{3}{4d} \cdot \frac{(2d)^4}{c^3}$  **19.**  $y^0 \cdot (8x^6y^{-3})^{-2}$  **20.**  $(5r^5)^3 \cdot r^{-2}$ 

**21.** Graph the function  $y = 4^x$ . Identify its domain and range.

- **22.** Graph the function  $y = \frac{1}{2} \cdot 4^x$ . Compare the graph with the graph of  $y = 4^x$ .
- **23. ANIMATION** About 10<sup>7</sup> bytes of data make up a single frame of an animated film. There are about 10<sup>3</sup> frames in 1 minute of a film. About how many bytes of data are there in 1 hour of an animated film?
- 24. **SALARY** A recent college graduate accepts a job at a law firm. The job has a salary of \$32,000 per year. The law firm guarantees an annual pay increase of 3% of the employee's salary.
  - **a.** Write a function that models the employee's salary over time. Assume that the employee receives only the guaranteed pay increase.
  - **b.** Use the function to find the employee's salary after 5 years.
- **25. SCIENCE** At sea level, Earth's atmosphere exerts a pressure of 1 atmosphere. Atmospheric pressure *P* (in atmospheres) decreases with altitude and can be modeled by  $P = (0.99987)^a$  where *a* is the altitude (in meters).
  - a. Identify the initial amount, decay factor, and decay rate.
  - **b.** Use a graphing calculator to graph the function.
  - **c.** Estimate the altitude at which the atmospheric pressure is about half of what it is at sea level.