

**Practice C**

For use with pages 456–461

Evaluate the exponential expression. Write your answer as a fraction in simplest form.

1.  $12^{-2}$
2.  $\left(\frac{2}{5}\right)^{-3}$
3.  $8^5(8^{-7})$
4.  $(-10)^0 \cdot \frac{1}{3^{-3}}$
5.  $6^{13} \cdot 6^{-10}$
6.  $11^{-2} \cdot 0^{-6}$
7.  $21^{-8} \cdot 21^8$
8.  $-9 \cdot (-9)^{-3}$
9.  $(5^3)^{-1}$
10.  $10^{-3} \cdot 20^0$
11.  $(-3^{-1})^{-5}$
12.  $15^{-5} \cdot 0^9$

Rewrite the expression with positive exponents.

13.  $14x^{-5}$
14.  $\frac{4}{5^{-2}x^{-7}}$
15.  $x^{-10}y^{21}$
16.  $20x^{-8}y^{-8}$
17.  $\frac{6}{18x^{-3}y^9}$
18.  $(-11)^{-2}y^0$
19.  $(7^{-2}x^8)^{-2}$
20.  $(4x^{-4}y^{-12})^{-5}$
21.  $-\frac{48x^{-6}y^8}{52x^9y^2}$
22.  $\frac{(8x^3)^{-2}}{2^{-4}x^{-10}}$
23.  $\frac{x^{-4}}{(12y^2)^{-2}}$
24.  $\left(\frac{-10x^{-15}}{x^{-15}}\right)^{-5}$

25. Complete the table.

$x$	-2	-1	0	1	2
$y = (0.40)^x$					

26. Graph the table of values in Exercise 25.

27. For the graph in Exercise 26, as the value of  $x$  increases, what happens to the value of  $y$ ?

28. **Endangered Species** Between 1990 and 2000, the population of an endangered species decreased at a rate of 0.1% per year. The population  $P$  in year  $t$  is given by  $P = 1200(0.999)^t$ , where  $t = 0$  corresponds to 1995. Find the population of the species in 1990, 1995, 2000, and the projected population in 2010.

29. **Town Population** Between 1960 and 1990, the population of a town increased at a rate of 0.34% per year. The population  $P$  in year  $t$  is given by  $P = 2000(1.0034)^t$ , where  $t = 0$  corresponds to 1980. Find the population of the town in 1960, 1970, 1980, and 1990.

30. **Radium Isotope** The half-life of the radium isotope  $\text{Ra}^{226}$  is about 1620 years. If there were initially 100 grams of  $\text{Ra}^{226}$ , then the number of grams remaining after  $h$  half-life periods is  $W = 100\left(\frac{1}{2}\right)^h$ . Complete the table.

<b>Half-life period, <math>h</math></b>	0	1	2	3	4	5	6
<b>Grams, <math>W</math></b>							

31. **Savings Account** You started a savings account in 1990. The balance  $A$  is modeled by  $A = 600(1.07)^t$ , where  $t = 0$  represents the year 2000. What is the balance in the account in 1990? in 2000? in 2010?