

Lesson 3-7

Example 1

Write in exponential form.

a. $8 \cdot 8 \cdot 8 \cdot 8 \cdot 8 \cdot 8$ b. $1.7 \cdot 1.7 \cdot 1.7 \cdot 1.7 \cdot 1.7$ c. $\frac{1}{12 \cdot 12 \cdot 12}$

Solution

a. 8^6 b. $(1.7)^5$ c. 12^{-3}

Example 2

Write in standard form.

a. 2^5 b. $(0.9)^1$ c. 25^0 d. 5^{-3}

Solution

a. $2^5 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$
 $= 32$

b. $(0.9)^1 = 0.9$

c. $25^0 = 1$

d. $5^{-3} = \frac{1}{5^3}$
 $= \frac{1}{5 \cdot 5 \cdot 5}$
 $= \frac{1}{125}$

Example 3**Write in scientific notation.**

a. 345,000

b. 0.00028

Solution

$$\begin{aligned} \text{a. } 345,000 &= 345,000. \\ &\quad \begin{array}{c} \text{3.45000} \\ \uparrow \\ \hline \end{array} \\ &= 3.45000 \cdot 10^5 \\ &= 3.45 \cdot 10^5 \end{aligned}$$

Move the decimal point left so it shows a number between 1 and 10.

To find the exponent on 10, count the number of decimal places you moved the decimal point to the left.

$$\begin{aligned} \text{b. } 0.00028 &= 0002.8 \cdot 10^2 \\ &\quad \begin{array}{c} \text{2.8} \\ \uparrow \\ \hline \end{array} \\ &= 2.8 \cdot 10^{-4} \end{aligned}$$

Move the decimal point to the right of the first nonzero digit.

Count the number of decimal places you moved the decimal point to the right.

Example 4**Write each number in standard form.**

a. $4.03 \cdot 10^7$

b. $2.358 \cdot 10^{-3}$

Solution

$$\begin{aligned} \text{a. } 4.03 \cdot 10^7 &= 40300000 \\ &\quad \begin{array}{c} \text{40,300,000} \\ \uparrow \\ \hline \end{array} \\ &= 40,300,000 \end{aligned}$$

Move the decimal point to the right 7 places.

$$\begin{aligned} \text{b. } 2.358 \cdot 10^{-3} &= .002358 \\ &\quad \begin{array}{c} \text{0.002358} \\ \uparrow \\ \hline \end{array} \\ &= 0.002358 \end{aligned}$$

Move the decimal point to the left 3 places.