

Lesson 5 Reteach

Compute with Scientific Notation

When you multiply and divide with numbers in scientific notation, multiply or divide the leading numbers first, then use the Product of Powers or Quotient of Powers properties to multiply or divide the powers of 10.

Example 1 Evaluate $(4.9 \times 10^3) \times (2 \times 10^5)$. Express the result in scientific notation.

$$= (4.9 \times 2) \times (10^3 \times 10^5) \quad \text{Commutative and Associative Properties.}$$

$$= (9.8) \times (10^3 \times 10^5) \quad \text{Multiply 4.9 by 2.}$$

$$= 9.8 \times 10^{3+5} \quad \text{Product of Powers}$$

$$= 9.8 \times 10^8 \quad \text{Add the exponents.}$$

When you add and subtract with numbers in scientific notation, the exponents must be the same. Sometimes you need to rewrite one of the numbers so it has the same exponent as the other.

Example 2 Evaluate $(4.68 \times 10^5) + (7.2 \times 10^6)$. Express the result in scientific notation.

$$= (4.68 \times 10^5) + (72 \times 10^5) \quad \text{Write } 7.2 \times 10^6 \text{ as } 72 \times 10^5.$$

$$= (4.68 + 72) \times 10^5 \quad \text{Distributive Property}$$

$$= 76.68 \times 10^5 \quad \text{Add 4.68 and 72.}$$

$$= 7.668 \times 10^6 \quad \text{Write } 76.68 \times 10^5 \text{ in scientific notation.}$$

Exercises

Evaluate each expression. Express the result in scientific notation.

1. $(4.3 \times 10^5)(7.5 \times 10^3)$

2. $(1.07 \times 10^2)(9.2 \times 10^{-3})$

3. $(1.41 \times 10^{-4})(27,000)$

4. $(7.53 \times 10^7)(8 \times 10^{-7})$

5. $\frac{3.96 \times 10^3}{1.8 \times 10^2}$

6. $\frac{1.68 \times 10^4}{2.8 \times 10^{-2}}$

7. $(2.4 \times 10^2) + (1.77 \times 10^3)$

8. $(5.18 \times 10^{-2}) + (4.9 \times 10^{-1})$

9. $(6.21 \times 10^7) + (1.1 \times 10^8)$

10. $(8.88 \times 10^4) - (8.8 \times 10^2)$

11. $(2.7 \times 10^{-6}) - (1.7 \times 10^{-8})$

12. $(7.328 \times 10^6) - (2.37 \times 10^5)$