

8-3 Study Guide and Intervention

Scientific Notation + SOLVING FOR A VARIABLE

Products and Quotients with Scientific Notation You can use properties of powers to compute with numbers written in scientific notation.

Example 1 Evaluate $(6.7 \times 10^3)(2 \times 10^{-5})$. Express the result in scientific and standard notation.

$$\begin{aligned} (6.7 \times 10^3)(2 \times 10^{-5}) &= (6.7 \times 2)(10^3 \times 10^{-5}) && \text{Associative Property} \\ &= 13.4 \times 10^{-2} && \text{Product of Powers} \\ &= (1.34 \times 10^1) \times 10^{-2} && 13.4 = 1.34 \times 10^1 \\ &= 1.34 \times (10^1 \times 10^{-2}) && \text{Associative Property} \\ &= 1.34 \times 10^{-1} \text{ or } 0.134 && \text{Product of Powers} \end{aligned}$$

LOOK: CALCULATOR NOT NEEDED, USE A SIDE CALCULATION FOR (6.7×2) IF NEEDED

The solution is 1.34×10^{-1} or 0.134.

Example 2 Evaluate $\frac{1.5088 \times 10^8}{4.1 \times 10^5}$. Express the result in scientific and standard notation.

$$\begin{aligned} \frac{1.5088 \times 10^8}{4.1 \times 10^5} &= \left(\frac{1.5088}{4.1} \right) \left(\frac{10^8}{10^5} \right) && \text{Associative Property} \\ &= 0.368 \times 10^3 && \text{Quotient of Powers} \\ &= (3.68 \times 10^{-1}) \times 10^3 && 0.368 = 3.68 \times 10^{-1} \\ &= 3.68 \times (10^{-1} \times 10^3) && \text{Associative Property} \\ &= 3.68 \times 10^2 \text{ or } 368 && \text{Product of Powers} \end{aligned}$$

LOOK: CALCULATORS OK FOR THE $\frac{1.5088}{4.1}$

The solution is 3.68×10^2 or 368.

Exercises

Evaluate. Express each result in scientific and standard notation.

1. $\frac{1.4 \times 10^4}{2 \times 10^2}$

2. $\frac{3 \times 10^{-12}}{2 \times 10^{-15}}$

3. $(3.2 \times 10^{-2})(2.0 \times 10^2)$

4. $\frac{1.2672 \times 10^{-8}}{2.4 \times 10^{-12}}$

5. $(7.7 \times 10^5)(2.1 \times 10^2)$

6. $\frac{9.72 \times 10^8}{7.2 \times 10^{10}}$

7. $(3.3 \times 10^5)(1.5 \times 10^{-4})$

8. $\frac{3.3 \times 10^{-12}}{1.1 \times 10^{-14}}$

9. $\frac{4 \times 10^{-4}}{2.5 \times 10^2}$

⑩ Solve for y ,

$$8x + 2y = 24$$

⑪ Solve for x ,

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