

10.7 Operations and Scientific Notation

Learning Targets



- Re-write numbers with new/different powers of 10
- Add and Subtract
- Multiply and Divide

Multiplying and Dividing Numbers in Scientific Notation

- **Multiply or Divide the Factors**
- **Multiply or Divide the Powers**
(Add or Subtract the Exponents)
- **Adjust and rewrite in
Scientific Notation if needed**

Multiplying and Dividing Numbers in Scientific Notation

Find $(3 \times 10^{-5}) \times (5 \times 10^{-2})$.

$$3 \times 10^{-5} \times 5 \times 10^{-2}$$

$$(3 \times 5) \times (10^{-5} \times 10^{-2})$$

$$15 \times 10^{-7}$$

$$1.5 \times 10^{-6}$$

- Multiply the Factors
- Multiply the Powers (add the exponents) ✓
- Adjust and rewrite in Scientific Notation if needed

Add the Exponents

Multiplying and Dividing Numbers in Scientific Notation

$$(4.6 \times 10^{-8}) \times (7 \times 10^0)$$

- Multiply the Factors
- Multiply the Powers (add the exponents)
- Adjust and rewrite in Scientific Notation if needed

$$(4.6 \times 7) \times 10^{-8} \quad 10^0 = 1$$

$$32.2 \times 10^{-8}$$

$$3.22 \times 10^{-7}$$

$$\begin{array}{r} 4 \\ 4.6 \\ \underline{7} \\ 32.2 \end{array}$$

Multiplying and Dividing Numbers in Scientific Notation

$$(4.5 \times 10^{12}) \div (1.5 \times 10^8)$$

$$\frac{4.5}{1.5} \times \frac{10^{12}}{10^8} \quad 12-8$$

$$3 \times 10^4$$

▪ Divide the Factors

▪ Divide the Powers

(Subtract the exponent in the denominator from the exponent in the numerator)

▪ Adjust and rewrite in Scientific Notation if needed

$$\begin{array}{r} 1.5 \overline{) 4.5} \\ \underline{3} \\ 15 \overline{) 45} \end{array}$$

Multiplying and Dividing Numbers in Scientific Notation

Find $\frac{1.5 \times 10^{-8}}{6 \times 10^7}$.

$$\frac{1.5}{6} \times \frac{10^{-8}}{10^7} \quad -8-7$$

$$0.25 \times 10^{-15}$$
$$\underline{2.5 \times 10^{-16}}$$

- Divide the Factors
- Divide the Powers
(Subtract the exponent in the denominator from the exponent in the numerator)
- Adjust and rewrite in Scientific Notation if needed

$$\begin{array}{r} 0.25 \\ 6 \overline{) 1.50} \\ \underline{12} \\ 30 \end{array}$$

Homework

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