

ALGEBRA 1

Chapter 8, Section 4

Scientific Notation

VOCABULARY:

• Scientific Notation –
• Standard Notation –
• Significant Digits –

GOALS:

- Use scientific notation to represent numbers.

WRITING A NUMBER IN SCIENTIFIC NOTATION

Scientific notation must be in the form $c \times 10^n$, where $1 \leq c < 10$ and n is an integer.

FROM STANDARD TO SCIENTIFIC

Move the decimal until you have a single digit in the ones place. Multiply the single digit and any remaining non-zero digits by 10 to the power of the spaces moved. If moving to the left, the exponent will be positive, if to the right, the exponent will be negative.

Example 1: $512600 = 5.126 \times 10^5$

Example 2: $.002356 = 2.356 \times 10^{-3}$

FROM SCIENTIFIC TO STANDARD

Move the decimal based on the power of the 10. If the power is positive you move it that number of digits to the right, if it is negative you move it that number of digits to the left.

Example 1: $2.45 \times 10^4 = 24,500$

Example 2: $1.205 \times 10^{-4} = .0001205$

1. Rewriting in Scientific Notation:

Rewrite in scientific notation.

a.) 75.3	b.) 135.667	c.) 0.00088
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2. Rewriting in Standard Form:

Rewrite in decimal form.

a.) 3.128×10^3	b.) 6.4×10^4	c.) 6.12×10^{-5}
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3. Computing with Scientific Notation:

Solve each expression in scientific notation.

$\begin{aligned} \text{a.) } & (1.4 \times 10^4)(7.6 \times 10^3) \\ & = (1.4 \cdot 7.6) \times (10^4 \cdot 10^3) \\ & = 10.64 \times 10^7 \\ & = 1.064 \times 10^8 \end{aligned}$	$\begin{aligned} \text{b.) } & \frac{1.2 \times 10^{-1}}{4.8 \times 10^{-4}} = \frac{1.2}{4.8} \times \frac{10^{-1}}{10^{-4}} \\ & = 0.25 \times 10^3 \\ & = 2.5 \times 10^2 \end{aligned}$	$\begin{aligned} \text{c.) } & (4.0 \times 10^{-2})^3 = 4^3 \times (10^{-2})^3 \\ & = 64 \times 10^{-6} \\ & = 6.4 \times 10^{-5} \end{aligned}$
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Multiply or Divide the following.

$\text{c.) } (4 \times 10^5)(2 \times 10^3)$	$\text{d.) } (2 \times 10^{-3})(6 \times 10^5)$
$\text{e.) } (3.5 \times 10^1)(4.5 \times 10^{-7})$	$\text{f.) } (6.8 \times 10^{-18})(2.5 \times 10^{-12})$
$\text{g.) } \frac{7.5 \times 10^8}{5 \times 10^{-2}}$	$\text{h.) } \frac{3.6 \times 10^{-3}}{9 \times 10^{-9}}$
$\text{i.) } \frac{7.2 \times 10^{-10}}{1.8 \times 10^{-3}}$	$\text{j.) } \frac{6.4 \times 10^{-3}}{8 \times 10^4}$