

Examples Problems with Scientific Notation

After you have visited the Web Sites that explain Scientific Notation and operations with Scientific Notation, review the following practice problems. Some of them may be more complicated than those presented on the Web Sites that you visited

The following examples are typical mathematical practice problems to get you used to using Scientific Notation with operations.

In all the examples significant digits are not taken into account.

Example 1: Simplify the following problems

$$(5.5 \times 10^8 + 6.2 \times 10^9 - 7.5 \times 10^6)(4.7 \times 10^4) = (5.5 \times 10^8 + 62. \times 10^8 - .075 \times 10^8)(4.7 \times 10^4)$$

Notice the terms in the parenthesis were changed to a terms in which the exponents of 10 are all equal to 8 .

$$67.579 \times 10^8(4.7 \times 10^4) = 317.6025 \times 10^{12}$$

You can round off if you wish. Typically I would prefer students to round off to the hundredths place value.

Thus the answer is 317.60×10^{12} This answer is not in Standard Form.

Standard Form Scientific Notation the answer would be 3.176×10^{14}

Example 2:

$$\frac{(.5 \times 10^{10} + 1.2 \times 10^9)(7 \times 10^{-6})}{(4.5 \times 10^{-4} + 2 \times 10^{-5})(4.7 \times 10^{30})} = \frac{(5 \times 10^9 + 1.2 \times 10^9)(7 \times 10^{-6})}{(4.5 \times 10^{-4} + .2 \times 10^{-4})(4.7 \times 10^{30})} =$$

$$\frac{(6.2 \times 10^9)(7 \times 10^{-6})}{(4.7 \times 10^{-4})(4.7 \times 10^{30})} = \frac{(43.4 \times 10^3)}{(22.09 \times 10^{26})} = 1.9647899 \times 10^{-23} \quad \text{or} \quad 1.97 \times 10^{-23}$$

Remember when dividing numbers with exponents you subtract the exponent in the denominator from the exponent in the numerator. Thus in example 2, the process of subtracting exponents is the following

$$\begin{array}{ccccccc} 3 & - & (-26) & = & -23 \\ \text{Numerator} & & \text{denominator} & & \text{exponent in final answer} \end{array}$$

Remember you subtract exponents when dividing.

In example 2, the answer is already in Standard Form.

The Worksheet on Scientific Notation that is to be completed and submitted for grading has several practice problems involving these more complicated arrangements of operations with Scientific Notation.

Remember to show all work (just as in the examples above) on the worksheet and to change to Standard Form when asked to do so.