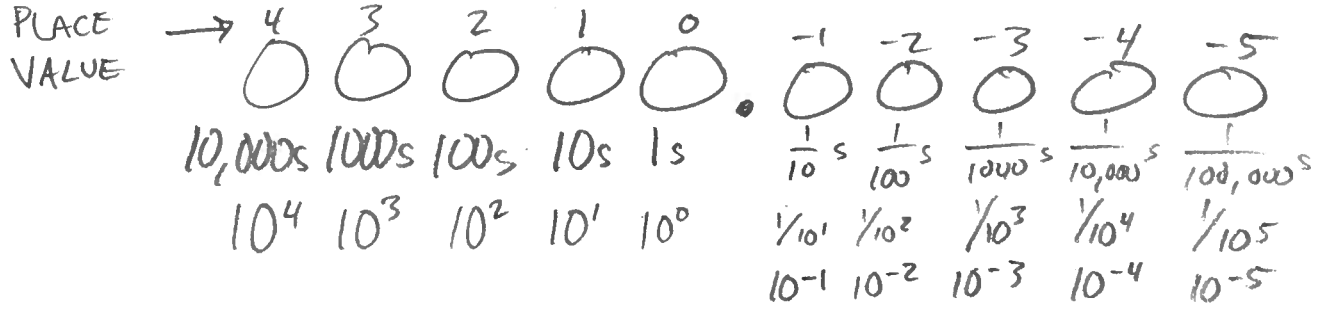
Scientific Notation Study Guide

Exponents as Place Values:



Multiplication

$(A \times B) \times (C \times D)$

$\rightarrow (A \times C) \times (B \times D)$

MULTIPLY COEFFICIENTS — ADD EXPONENTS

RE-WRITE ANSWER IN STANDARD NOTATION IF NECESSARY.

FOR EX.

$(3 \times 10^{19}) \times (7 \times 10^{10})$

$(3 \times 7) \times (10^{19} \times 10^{10})$

21×10^{29}

$\boxed{2.1 \times 10^{30}}$

Division

$(A \times B) \div (C \times D)$

$\frac{A \times B}{C \times D} = \frac{A}{C} \times \frac{B}{D}$

SO.. $(A \div C) \times (C \div D)$

DIVIDE COEFFICIENTS — SUBTRACT EXPONENTS

RE-WRITE IN STANDARD NOTATION IF NEC.

FOR EX.

$(8.1 \times 10^{14}) \div (9. \times 10^{6})$

$(8.1 \div 9) \times (10^{14} \div 10^{6})$

0.9×10^{8}

$\boxed{9 \times 10^{7}}$

ADDITION AND SUBTRACTION

EXPONENTS TELL PLACE VALUE INFORMATION ONLY.

EXAMPLES: $(3 \times 10^{12}) + 4.0 \times 10^{13})$

$$\boxed{4.3 \times 10^{13}}$$

$$\begin{array}{cccc} \cdots & 10^{13} & 10^{12} & 10^{11} \cdots \\ & & 3 & \\ + & 4 & 0 & \\ \hline & 4 & 3 & \end{array}$$

$(5.0 \times 10^{-7}) - (3 \times 10^{-8})$

$$\boxed{4.7 \times 10^{-7}}$$

$$\begin{array}{cccc} \cdots 10^{-6} & 10^{-7} & 10^{-8} & \cdots \\ & 5 & 0 & \\ - & & 3 & \\ \hline & 4 & 7 & \end{array}$$

- PUT DIGITS IN PLACE VALUE COLUMNS.
- ENTER ZEROS AS NECESSARY.
- ADD OR SUBTRACT
- PLACE DOT AFTER FIRST NON-ZERO DIGIT ON THE LEFT.
- WRITE (COEFFICIENT $\times 10^n$) WHERE n = THE PLACE VALUE OF THE DIGIT NEXT TO THE DOT.