

Standard Form

Standard form is sometimes called Scientific Notation and is used to represent very small and very large numbers

In standard form a number is written as a number between 1 and 10 multiplied by a power of 10

Examples $356 = 3.56 \times 10^2$

$$41.4 = 4.14 \times 10^1$$

$$\underline{78,000,000} = 7.8 \times 10^7$$

$$\underline{0.00032} = 3.2 \times 10^{-4}$$

$$0.00000623 = 6.23 \times 10^{-6}$$

Real World Examples

Mass of Earth 5.972×10^{24} kg

Mars 6.39×10^{23} kg

Jupiter 1.898×10^{27} kg

Sun 1.989×10^{30} kg

Electron 9.11×10^{-31} kg

Proton 1.67×10^{-27} kg

Standard Form Arithmetic Non-Calculator

Addition $2.5 \times 10^3 + 4.1 \times 10^4$

$$\begin{array}{r} 2500 \\ 41000 + \\ \hline 43500 \end{array} = 4.35 \times 10^4$$

Subtraction $6.8 \times 10^7 - 1.4 \times 10^5$

$$\begin{array}{r} 68000000 \\ 140000 - \\ \hline 67860000 \end{array} = 6.786 \times 10^7$$

Multiplication $3 \times 10^7 \times 4 \times 10^5$

$$= 12 \times 10^{12}$$

$$= \underline{1.2 \times 10^{13}}$$

Division $8 \times 10^4 \div 2 \times 10^{-7}$

$$= 4 \times 10^{4-(-7)}$$

$$= \underline{4 \times 10^{11}}$$