Unit 1 : Intro Skills

A. Scientific Notation

Scientific notation is a short hand (or simple) way to write either very large or very small numbers.

The mass of the Earth is $5.980\,000\,000\,000\,000\,000\,000\,000$ kg.
This becomes : 5.98×10^{24} kg

To write a number in scientific notation :

1) Always place the decimal behind the first non-zero number.
2) Count how many places the decimal moved (this becomes the exponent)
   - If the number is very large (> 0), the exponent is positive.

$450\,000. \rightarrow 4.5 \times 10^{5}$

5 spaces

$405\,000. \rightarrow 4.05 \times 10^{5}$

   - If the number is very small (< 0), the exponent is negative.

$0.000\,59 \rightarrow 5.9 \times 10^{-4}$

4 spaces to the right

B. Significant Figures (Sig. figs.)

Significant figures represent the number of important digits in a value. They're used to show how precise a measurement is.

Rules for Using Significant Figures

1) All non-zero digits are significant.
   ex: 123 → 3 sig. figs.

2) Any zeros in between two other significant digits are always significant.
   ex: 1003 → 4 sig. figs.
   2.05 → 3 sig. figs.

3) Any leading zeros are <u>not</u> significant.
   ex: 0.0012 → 2 sig. figs.
   (leading zeros)

   0.0705 → 3 sig. figs.
   (leading zeros; counts)

4) Trailing zeros
   a) w/ decimals → count zeros as significant
      ex: 0.0070 → 2 sig. figs.
      (leading zero; trailing zero)

   b) no decimals → zeros are not significant.
      ex: 3700 → 2 sig. figs.

* To know for sure, write the original number in scientific notation. If you can get rid of any zeros, they are not significant.

Example: Perform the following operations. Express your final answer with 3 sig. figs.

a) $3.22\ cm \times 2.1\ cm$
$= 6.762\ cm^2$
$= 6.76\ cm^2$

b) $24.686 + (2.343)(3.21)$
$= 24.686 + 7.62103$
$= 32.20703$

$= 6.762\ cm^2$

$= 6.76\ cm^2$

$= 24.686 + 7.62103$

$= 32.20703$

$= 32.2$

p. 16 # 1-3

p. 24 # 12,13

p. 25 # 14-17 (Express answers with 3 sig. figs.)