Physics Notes – chapter 1

3 fundamental measurements – length, mass, and time

SI units (Systeme International)
Length – meter (m)
Mass – kilogram (kg)
Time – second (s)

Metric prefixes – memorize these

Abbreviation	Prefix	Power
E	exa	10^{18}
P	peta	10^{15}
T	tera	10^{12}
G	giga	10^{9}
M	mega	10^{6}
k	kilo	10^{3}
da	deka	10
	(no prefix)	1
d	Deci	10^{-1}
c	centi	10^{-2}
m	milli	10^{-3}
μ	micro	10^{-6}
n	nano	10^{-9}
p	pico	10^{-12}
f	femto	10^{-15}
a	atto	10^{-18}

Metric conversions (dimensional analysis)

450 cm = _____ m $\rightarrow$ $450\ cm \times \frac{1\ m}{100\ cm} = 4.5\ m$

0.00358 km = _____ mm →

$$0.00358\ km \times \frac{1000\ m}{1\ km} \times \frac{1000\ mm}{1\ m} = 3580\ mm$$

Given 1 inch = 2.54 cm, 9 yards = _____ m →

$$9\ yards \times \frac{3\ ft}{1\ yd} \times \frac{12\ in}{1\ ft} \times \frac{2.54\ cm}{1\ in} \times \frac{1\ m}{100\ cm} = 8.23\ m$$

Significant figures

0.0068 – has two sig figs
408 – has three sig figs
40800 has three sig figs
40800.0 has six sig figs

When multiplying (or dividing) sig figs, the product has the same number of sig figs as the number with the least sig figs being multiplied

608 000 (three sig figs) X 0.0031 (two sig figs) = 1884.8 → 1900 (two sig figs)

When adding (or subtracting) numbers whose accuracy is important, sig figs, the answer should have the same column of accuracy as the addend, number, with the least decimal places to the right of the decimal.

102 + 3.14 = 105

0.0082 + 12.111 = 12.119

Also, in science we do not use commas in large numbers, we use spaces, or scientific notation

1,000,000 → 1 000 000 → 1×10^6