General Physics I
Classnotes

Jonathan Henrique Maia de Moraes (ID: 1620855)

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1 Metric Prefixes

10^{12}	$= 1,000,000,000,000$	tera	T
10^{9}	$= 1,000,000,000$	giga	G
10^{6}	$= 1,000,000$	mega	M
10^{3}	$= 1,000$	kilo	k
10^{0}	$= 1$	$-$	$-$
10^{-2}	$= 0.01$	centi	c
10^{-3}	$= 0.001$	milli	m
10^{-6}	$= 0.000,001$	micro	μ
10^{-9}	$= 0.000,000,001$	nano	n
10^{-12}	$= 0.000,000,000,001$	pico	p

2 Basic Quantities

	Metric	English
Length	$m =$ meter	$ft =$ foot
Mass	$kg =$ kilogram	$sl =$ slug
Time	$s =$ second	$s =$ second

$$1\text{day} = 24 \times 60 \times 60 = 86,400\ s$$
$$1\text{day} = 10 \times 100 \times 100 = 100,000\ s$$

3 Derived Quantities

velocity/speed	mi/s	km/h	m/min	...	$[L]/[T]$
area	cm^2	m^2	...	...	$[L]^2$
density	g/cm^3	kg/m^3	...	...	$[M]/[L]^3$

4 Conversions

$$
\begin{array}{lcl}
1\ min & \equiv & 60\ s \\
1\ h & \equiv & 60\ min \\
1\ ft & \equiv & 12\ in \\
1\ mi & \equiv & 5280\ ft \\
1\ L & \equiv & 1,000\ cm^3 \\
1\ mi^2 & \equiv & 640\ acres \\
1\ in & \equiv & 2.54\ cm
\end{array}
$$

Example:

$$
\begin{aligned}
70\ mi/h &= ?\ m/s \\
&= 70\ mi/h \times \left(\frac{5280\ ft}{1\ mi}\right) \times \left(\frac{12\ in}{1\ ft}\right) \times \left(\frac{2.54\ cm}{1\ in}\right) \times \left(\frac{1\ m}{100\ cm}\right) \\
&\quad \times \left(\frac{1\ h}{60\ min}\right) \times \left(\frac{1\ min}{60\ s}\right) \\
&= 31.2928\ m/s
\end{aligned}
$$

Example:

$$
\begin{aligned}
350 in^3 &= ?\ L \\
&= 350\ in^3 \times \left(\frac{2.54\ cm}{1\ in}\right)^3 \times \left(\frac{1\ L}{1000\ cm^3}\right) \\
&= 5.7355\ L
\end{aligned}
$$

Homework:

$$\begin{aligned} 1acre &= ?\ in^2 \\ &= 1\ acre \times \left(\frac{1\ mi^2}{640\ acres}\right) \times \left(\frac{5280\ ft}{1\ mi}\right)^2 \times \left(\frac{12\ in}{1\ ft}\right)^2 \\ &= 6,272,640\ in^2 \end{aligned}$$