AzSCI Formula Reference Guide

Equation

$\vec{v} = \lambda f$

$\vec{v} = \frac{\Delta \vec{x}}{\Delta t}$

$\vec{a} = \frac{\Delta \vec{v}}{\Delta t} = \frac{\vec{v}_f - \vec{v}_i}{\Delta t}$

$\vec{F}_{Net} = \vec{F}_1 + \vec{F}_2 + \vec{F}_3 + \cdots$

$\vec{F}_{Net} = m\vec{a}$

$\vec{F}_{Net} = \frac{m\vec{v}^2}{r}$

$\vec{F}_g = m\vec{g}$

$\vec{F}_g = \frac{Gm_1m_2}{r^2}$

$\vec{F}_e = \frac{Kq_1q_2}{r^2}$

$\vec{F}_{sp} = -k\Delta\vec{x}$

$\vec{p} = m\vec{v}$

$\Delta\vec{p} = \vec{F}\Delta t$

$\vec{F}\Delta t = m\Delta\vec{v} = m\vec{v}_f - m\vec{v}_i$

$E_{tot} = E_1 + E_2 + E_3 + \cdots$

$PE_g = mgh$

$KE = \frac{1}{2}m\vec{v}^2$

$PE_E = \frac{1}{2}k\Delta\vec{x}^2$

$\Delta E = W = \vec{F}\Delta\vec{x}$

$P = \frac{\Delta E}{\Delta t}$

Constants

$c = Speed\ of\ light = 3.00x10^8\ \frac{m}{s}$
$g_{Earth} = 9.8\ \frac{m}{s^2}$
$G = 6.67x10^{-11}\ \frac{N \cdot m^2}{kg^2}$
$K = 9.00x10^9\ \frac{N \cdot m^2}{C^2}$

Symbol	Meaning	Unit of Measurement
$\vec{v}$	Average velocity	$\frac{m}{s}$
$\Delta\vec{v}$	Change in velocity	$\frac{m}{s}$
$\vec{v}_i$	Initial velocity	$\frac{m}{s}$
$\vec{v}_f$	Final velocity	$\frac{m}{s}$
λ	Wavelength	m
f	Frequency	Hz or $\frac{1}{s}$
$\Delta\vec{x}$	Horizontal displacement	m
Δt	Change in time	s
$\vec{a}$	Acceleration	$\frac{m}{s^2}$
$\vec{F}_{Net}$	Net force	N or $\frac{kg \cdot m}{s^2}$
$\vec{F}_g$	Gravitational force	N or $\frac{kg \cdot m}{s^2}$
$\vec{F}_e$	Electric force	N or $\frac{kg \cdot m}{s^2}$
$\vec{F}_{sp}$	Force applied by a spring	N or $\frac{kg \cdot m}{s^2}$
m	mass	kg
r	Distance between two objects	m
$\vec{g}$	Acceleration due to gravity	$\frac{m}{s^2}$
h	Height	m
q	Charge	C
k	Spring constant	$\frac{N}{m}$ or $\frac{kg}{s^2}$
K	Coulombs constant	$\frac{N \cdot m^2}{C^2}$
$\vec{p}$	Momentum	$kg \cdot \frac{m}{s}$ or $N \cdot s$
E_{tot}	Total energy	J
PE_g	Gravitational potential energy	J
PE_E	Elastic potential energy	J
KE	Kinetic energy	J
ΔE	Change in energy	J
W	Work	J or $N \cdot m$
P	Power	W or $\frac{J}{s}$