$v_{av} = \frac{\Delta d}{\Delta t}$ $\Delta d = d_f - d_i$ $\Delta t = t_f - t_i$

$a = \frac{\Delta v}{\Delta t} = \frac{v_f - v_i}{t_f - t_i}$

$d = \frac{1}{2}at^2 + v_i t$

$d_y = \frac{1}{2}gt^2 + v_{iy}t$

$v_f = at + v_i$

$d_y = \frac{1}{2}gt^2 + v_{iy}t$

$d_x = \frac{1}{2}at^2 + v_{ix}t$

$v_{fy}^2 = v_{iy}^2 + 2g d_y$

$v_{fx}^2 = v_{ix}^2 + 2a d_x$

$v_f = at + v_i$

$v_{fx} = axt + v_{ix}$

$v_{fy} = gt + v_{iy}$

SOH CAH TOA

$\sin\theta = \frac{opp}{hyp}$ $\cos\theta = \frac{adj}{hyp}$ $\tan\theta = \frac{opp}{adj}$

$R^2 = R_x^2 + R_y^2$

$F = ma$ (or $w = mg$)

$N = \frac{kg \cdot m}{s^2}$ $g = 9.8\ m/s^2$

$g = 32.2\ ft/s^2$

$\frac{N}{kg} = \frac{\frac{kg \cdot m}{s^2}}{kg} = \frac{kg \cdot m}{s^2} \cdot \frac{1}{kg}$

Current $I = \frac{\Delta q}{\Delta t}$ $V = \frac{J}{C}$

V = potential difference

$V = IR$ Ω = Ohms

$P = IV$ $P = \frac{qV}{t}$

$W = qV$ $R = \frac{V^2}{P}$

Series:

$R_T = R_1 + R_2 + R_3 + \ldots$

Parallel:

$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \ldots$

$F_{in} d_{in} = F_{out} d_{out}$ $AMA = \frac{F_{out}}{F_{in}}$

$IMA = \frac{d_{in}}{d_{out}}$

efficiency $= \frac{W_{out}}{W_{in}} = \frac{AMA}{IMA}$

$T = \frac{1}{f}$ $V = \frac{2\pi r}{T}$

$a_c = \frac{v^2}{r}$ $F_c = ma_c$

$\omega = \frac{\theta + \theta_i}{t}$ $\alpha = \frac{\omega_f - \omega_i}{t}$ $\alpha = \frac{\Delta\omega}{t}$

$F_x = ma_x$ $F_y = ma_y$ $F_z = ma_z$

$\sum F_x = \sum F_y = \sum F_z = 0$

F_n = normal force $\perp$

$\sin\theta = \frac{F}{mg}$ $\cos\theta = \frac{F_n}{mg}$

$F = mg\sin\theta$ $F_n = mg\cos\theta$

$F_f = \mu F_n$

$p = mv$ $J = Ft$ $J = p$ $Ft = mv$

$m_1 v_{1i} + m_2 v_{2i} = m_1 v_{1f} + m_2 v_{2f}$

or

$p_{1i} + p_{2i} = p_{1f} + p_{2f}$

$Ft = m(v_f - v_0)$

$m_1 v_{1i} + m_2 v_{2i} = (m_1 + m_2) v_f$

$(m_1 + m_2) v_i = m_1 v_{1f} + m_2 v_{2f}$

$m_1 u_1 + m_2 u_2 = m_1 V_1 + m_2 V_2$

$\frac{1}{2}m_1 u_1^2 + \frac{1}{2}m_2 u_2^2 = \frac{1}{2}m_1 v_1^2 + \frac{1}{2}m_2 V_2^2$

$e = \frac{V_2 - V_1}{u_1 - u_2}$ $P = \frac{F}{A}$

$W = F \cdot d$ $W = F \cdot d \cdot \cos\theta$

$P = \frac{W}{t}$ or $P = \frac{F \cdot d}{t}$ $P = Fv$

$PE = mgh$ $KE = \frac{1}{2}mv^2$

$E_i = E_f$ $PE_i + KE_i = PE_f + KE_f$

$mgh_i + \frac{1}{2}mv_i^2 = mgh_f + \frac{1}{2}mv_f^2$

$F = \frac{k q_1 q_2}{d^2}$ $\mathcal{E} = \frac{F}{q_0}$ $\mathcal{E} = \frac{V}{d}$

$p = \frac{W}{t}$

p = Momentum

J = Impulse

$p = \frac{kg \cdot m}{s}$ or $\frac{slug \cdot ft}{s}$

J = N·s or lbs·s

P = Pressure

$P = \frac{N}{m^2}$ = Pascal (Pa)

W = Work

W = N·m (Joule) or lb·ft

P = Power

$P = \frac{N \cdot m}{s}$ (Watts) or $\frac{lb \cdot ft}{s}$

PE = Potential E

KE = Kinetic E

E = J, N·m, or lb·ft

$k = 9 \times 10^9\ \frac{N \cdot m^2}{C^2}$

q = Charge in C

$\mathcal{E}$ = Strength of electric field.

$K = 9 \times 10^9\ \frac{N \cdot m^2}{C^2}$