Possibly useful relations:

$$\vec{A} = A_x\hat{i} + A_y\hat{j} + A_z\hat{k} \qquad |\vec{A}| = \sqrt{A_x^2 + A_y^2 + A_z^2}$$

$$\vec{v}_{\text{avg}} = \frac{\Delta\vec{r}}{\Delta t} \qquad \vec{v}(t) = \frac{d\vec{r}}{dt} \qquad \vec{a}_{\text{avg}} = \frac{\Delta\vec{v}}{\Delta t}$$

$$\vec{a}(t) = \frac{d\vec{v}}{dt} \qquad \vec{v_f} = \vec{v_i} + \vec{a}t \qquad v_{\text{avg}} = \frac{v_i + v_f}{2}$$

$$x_f = x_i + v_i t + \frac{1}{2}at^2 \qquad \vec{r}_f = \vec{r}_i + \vec{v}_i t + \frac{1}{2}\vec{a}t^2 \qquad x_f = x_i + v_{\text{avg}} t$$

$$v_f^2 = v_i^2 + 2a\Delta x \qquad a_c = \frac{v^2}{r}$$

$$v = \frac{2\pi r}{T} \qquad v = r\omega \qquad \omega = \frac{2\pi}{T}$$

$$\vec{v}_{AB} = \vec{v}_{AC} + \vec{v}_{CB} \qquad \Sigma\vec{F} = m\vec{a} \qquad \vec{F}_{AB} = -\vec{F}_{BA}$$

$$\vec{W} = m\vec{g} \qquad f_S \leq \mu_S N \qquad f_K = \mu_K N$$

$$W = F\Delta x \qquad W = \vec{F}\cdot\Delta\vec{r} \qquad W = \int \vec{F}\cdot d\vec{r}$$

$$W = \Delta K \qquad K = \frac{1}{2}mv^2 \qquad \Delta U = -W$$

$$\vec{A}\cdot\vec{B} = AB\cos\theta = A_xB_x + A_yB_y + A_zB_z \qquad F_x = -\frac{dU}{dx}$$

$$F = -kx$$

$$U = mgy + U_0 \qquad U = \frac{1}{2}kx^2 + U_0 \qquad K_i + U_i = K_f + U_f$$

$$\Delta U + \Delta K + \Delta E_{\text{int}} = W^{\text{ext}} \qquad \Delta E_{\text{int}} = f_K d \qquad E_{\text{total}}^{\text{isolated}} = \text{const.}$$

$$P = \frac{dE}{dt} \qquad P = \frac{dW}{dt} \qquad P = \vec{F}\cdot\vec{v}$$

$$\vec{p} = m\vec{v} \qquad \vec{F} = \frac{d\vec{p}}{dt} \qquad \vec{p}_{\text{total}} = \text{const.}$$

$$\vec{I} = \Delta\vec{p} = \int \vec{F}dt = \vec{F}_{\text{av}}\Delta t \qquad \vec{r}_{\text{cm}} = \frac{1}{M}\Sigma\vec{r}_i m_i \qquad \vec{r}_{\text{cm}} = \frac{1}{M}\int \vec{r}dm$$

$$\Sigma\vec{F}_{\text{ext}} = M\vec{a}_{\text{cm}} \qquad M\vec{v}_{\text{cm}} = \vec{p}_{\text{total}}$$

$$s = r\theta \qquad v = r\omega \qquad a_T = r\alpha$$

$$\omega = \frac{d\theta}{dt} \qquad \alpha = \frac{d\omega}{dt}$$

(over)

$\theta_f = \theta_i + \omega_i t + \frac{1}{2}\alpha t^2$ $\quad$ $\omega_f = \omega_i + \alpha t$ $\quad$ $\omega_f^2 = \omega_i^2 + 2\alpha\Delta\theta$

$\theta_f = \theta_i + \omega_{\text{avg}} t$ $\quad$ $\tau = Fr\sin\phi = Fd$ $\quad$ $\Sigma\tau_{\text{ext}} = I\alpha$

$\vec{\tau} = \vec{r} \times \vec{F}$ $\quad$ $|\vec{A} \times \vec{B}| = AB\sin\theta$

$I = \Sigma m_i r_i^2$ $\quad$ $I = \int r^2 dm$ $\quad$ $I = I_{\text{cm}} + MD^2$

$\vec{L} = \vec{r} \times \vec{p}$ $\quad$ $\vec{L} = I\vec{\omega}$

$K_{\text{rot}} = \frac{1}{2} I_{\text{cm}} \omega^2$ $\quad$ $v_{\text{cm}} = R\omega$ $\quad$ $a_{\text{cm}} = R\alpha$

$W = \int \tau d\theta$ $\quad$ $P = \tau\omega$ $\quad$ $\vec{L}_{\text{total}} = \text{constant}$

$\Sigma\vec{\tau} = \frac{d\vec{L}}{dt}$ $\quad$ $\Sigma\vec{F}_{\text{ext}} = 0$ $\quad$ $\Sigma\vec{\tau}_{\text{ext}} = 0$

$\vec{F}_{12} = -\frac{Gm_1 m_2}{r_{12}^2}\,\hat{r}_{12}$ $\quad$ $T^2 = (\frac{4\pi^2}{GM})R^3$ $\quad$ $U(r) = -\frac{Gm_1 m_2}{r} + U_0$

$\rho = \frac{M}{V}$ $\quad$ $P = \frac{F}{A}$

$P = P_0 + \rho g h$ $\quad$ $P_{\text{gauge}} = P - P_0$ $\quad$ $B = W_{\text{disp}}$

$v_1 A_1 = v_2 A_2$ $\quad$ $P + \frac{1}{2}\rho v^2 + \rho g y = \text{const.}$ $\quad$ $x = A\cos(\omega t + \phi)$

$v = -\omega A \sin(\omega t + \phi)$ $\quad$ $a = -\omega^2 A\cos(\omega t + \phi)$ $\quad$ $\omega = \sqrt{k/m}$

$f = 1/T$ $\qquad$ $T = \frac{2\pi}{\omega}$ $\quad$ $E = \frac{1}{2}kA^2$ $\quad$ $T = 2\pi\sqrt{L/g}$

$F_d = -bv$ $\quad$ $x = A\exp^{-\frac{b}{2m}t}\cos(\omega t + \phi)$

$\omega_0 = \sqrt{k/m}$ $\quad$ $A = F_0/\sqrt{m^2(\omega_0^2 - \omega^2)^2 + b^2\omega^2}$

$y = f(x \pm vt)$ $\quad$ $v = \lambda f$ $\quad$ $k = \frac{2\pi}{\lambda}$

$y = A\cos(kx \pm \omega t)$ $\quad$ $v = \sqrt{T/\mu}$ $\quad$ $P = \frac{1}{2}\mu v \omega^2 A^2$

$\frac{\partial^2 y}{\partial x^2} = \frac{1}{v^2}\frac{\partial^2 y}{\partial t^2}$ $\quad$ $v = \sqrt{B/\rho}$ $\quad$ $I = \frac{P_{\text{av}}}{A}$

$\beta = 10\log_{10}(I/I_0)$ $\quad$ $f' = (\frac{v \pm v_0}{v \mp v_s})f$ $\quad$ $y = 2A\cos(kx)\cos(\omega t)$

$f_n = n\frac{v}{2L}$, $\;n = 1,2,3...$ $\quad$ $f_n = n\frac{v}{4L}$ $\;n = 1,3,5...$ $\quad$ $f_{\text{beat}} = |f_1 - f_2|$

$\cos\theta = \text{adjacent/hypo.}$ $\quad$ $\sin\theta = \text{opposite/hypo.}$

$\tan\theta = \frac{\sin\theta}{\cos\theta}$ $\quad$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$g = 9.8\ \text{m/s}^2$ downward $\quad$ $P_0 = 1.01 \times 10^5\ \text{Pa}$

$G = 6.67 \times 10^{-11}\ \text{Nm}^2/\text{kg}^2$ $\quad$ $I_0 = 10^{-12}\ \text{W/m}^2$