Possibly useful relations:

$\vec{A} = A_x\hat{i} + A_y\hat{j} + A_z\hat{k}$	$A = \lvert\vec{A}\rvert = \sqrt{A_x^2 + A_y^2 + A_z^2}$	rotate the right hand fingers
$\vec{A}\cdot\vec{B} = AB\cos(\theta)$	$\vec{A}\times\vec{B} = \vec{C}$, $C = AB\lvert\sin(\theta)\rvert$	from $\vec{A}$ to $\vec{B}$ to get $\vec{C}$
$\cos\theta =$ adjacent/hypotenuse	$\tan\theta = \sin\theta/\cos\theta$	$v = \omega r$
$\sin\theta =$ opposite/hypotenuse	$x = \frac{-b\pm\sqrt{b^2-4ac}}{2a}$	$a = \alpha r$
$\vec{v}_{\rm avg} = \Delta\vec{r}/\Delta t$	$\vec{v}(t) = \frac{d\vec{r}}{dt}$	$\omega(t) = \frac{d\theta}{dt}$
$\vec{a}_{\rm avg} = \Delta\vec{v}/\Delta t$	$\vec{a}(t) = \frac{d\vec{v}}{dt}$	$\alpha(t) = \frac{d\omega}{dt}$
$\vec{v_f} = \vec{v_i} + \vec{a}t$	$v_{\rm avg} = \frac{v_i+v_f}{2}$	$\omega_{\rm avg} = \frac{\omega_i+\omega_f}{2}$
$x_f = x_i + v_i t + \frac{1}{2}at^2$	$\vec{r}_f = \vec{r}_i + \vec{v}_i t + \frac{1}{2}\vec{a}t^2$	$\theta_f = \vec{\theta}_i + \vec{\omega}_i t + \frac{1}{2}\vec{\alpha}t^2$
$x_f = x_i + v_{\rm avg}t$	$v_f^2 = v_i^2 + 2a\Delta x$	$\omega_f^2 = \omega_i^2 + 2\alpha\Delta\theta$
$\vec{v}_{AB} = \vec{v}_{AC} + \vec{v}_{CB}$		
$\Sigma\vec{F} = m\vec{a}$	$\vec{F}_{AB} = -\vec{F}_{BA}$	$\Sigma\vec{\tau} = I\vec{\alpha}$
$\vec{F}_g = \vec{W} = m\vec{g}$	$\vec{F}_{12} = G\frac{m_1 m_2}{r_{12}^2}\hat{r}_{12} = -\vec{F}_{21}$	$\vec{\tau} = \vec{r}\times\vec{F}$
$f_s \le \mu_s N$, $f_K = \mu_K N$	$F_D = \frac{1}{2}C\rho A v^2$	$\tau = rF\lvert\sin\theta\rvert = r_\perp F = rF_\perp$
$a_c = \frac{v^2}{r} = \omega^2 r$	$v = \frac{2\pi}{T}r = \omega r$	$I = I_{CM} + md^2$
Static equilibrium:	$\Sigma_i\vec{F}_i = 0$	$\Sigma_i\vec{\tau}_i = 0$
$dW = \vec{F}\cdot d\vec{r} = \lvert\vec{F}\rvert\lvert d\vec{r}\rvert\cos\theta$	$W_{AB} = \int_A^B \vec{F}\cdot d\vec{r}$	$W_{AB} = \int_{\theta_A}^{\theta_B}\vec{\tau}d\theta$
$E = K + K_{rot} + U$	$K = m\frac{v^2}{2}$, $\Delta K = W_{net}$	$K_{rot} = I\frac{\omega^2}{2}$
$U_g = mgy$, $U(r) = -G\frac{mM}{r}$	$U_s(x) = k\frac{(x-x_0)^2}{2}$	I_{CM} will be provided
$\Delta E = W_{non\ cons}$	$P = \frac{dW}{dt}$, $P = \vec{F}\cdot\vec{v}$	$P = \tau\omega$
$\vec{P} = \Sigma_i m_i\vec{v}_i$	$\Delta\vec{P} = \vec{J} = \int_{t_1}^{t_2}\vec{F}_{ext}dt$	$\vec{L} = \Sigma_i(\vec{r}_i\times(m_i\vec{v}_i))$, $L = I\omega$
	$\frac{d\vec{P}}{dt} = \vec{F}_{ext}$,	$\frac{d\vec{L}}{dt} = \vec{\tau}_{ext}$,
Is energy conserved?	yes $\rightarrow$ elastic interaction	no $\rightarrow$ inelastic interaction
$F_b = \rho_{fl}Vg$, subm $= \rho_o/\rho_{fl}$, $P = \frac{F}{A}$	$P_1 + \rho g y_1 + \rho\frac{v_1^2}{2} = P_2 + \rho g y_2 + \rho\frac{v_2^2}{2}$	Flow rate: $Q = v_1 A_1 = v_2 A_2$
$\ddot{x} = -\omega_0^2 x$	$x = A\cos(\omega_0 t + \phi)$	$v = \dot{x} = -\omega_0 A\sin(\omega_0 t + \phi)$
$\omega = \frac{2\pi}{T} = 2\pi f$	$\omega_0 = \sqrt{\frac{k}{m}}$, $\omega_0 = \sqrt{\frac{g}{L}}$	$E \sim A^2$
$x_0 = x(t=0)$, $v_0 = v(t=0)$	$A = \sqrt{x_0^2 + (v_0/\omega_0)^2}$	$\tan(\phi) = -v_0/(x_0\omega_0)$
$\ddot{x} = -\omega_0^2 x - \gamma\dot{x}$	$A(T_e) = A/e$	$x(t) = (Ae^{-\gamma t/2})\cos(\omega t + \phi)$
$\ddot{x} = -\omega_0^2 x - \gamma\dot{x} + F/m\cos(\omega t)$	$A(\omega) = \frac{F/m}{\sqrt{(\omega^2-\omega_0^2)^2+(\gamma\omega)^2}}$	$x(t) = A(\omega)\cos(\omega t + \phi)$
	$A(\omega_0) = \frac{F}{m\omega_0^2}Q$	$T_e = NT$, $N = \frac{Q}{\pi}$, $Q = \frac{\omega_0}{\gamma}$
$\frac{\partial^2 y(x,t)}{\partial x^2} = \frac{1}{v^2}\frac{\partial^2 y(x,t)}{\partial t^2}$, $k = \omega/v$	$y(x,t) = y(x\pm vt)$, $k = 2\pi/\lambda$	$y(x,t) = A\cos(kx \pm \omega t)$
$y(x,t) = y_1(x,t) + y_2(x,t)$	$y(x,t) = A\cos(\omega t)\sin(kx)$	$k = n\pi$, $L = n\lambda/2$, $v = \sqrt{\frac{F_T}{\mu}}$
$G = 6.67\times10^{-11}\frac{N\ m^2}{kg^2}$	use g=10 m/s^2 instead of 9.8 m/s^2	