$\vec{F}_{net} = m\vec{a} \qquad \Delta\theta = \theta - \theta_0 \qquad \Delta\omega = \omega - \omega_0 \qquad s = r\theta$

$\vec{v} = \frac{d\vec{r}}{dt} \qquad \vec{a} = \frac{d\vec{v}}{dt} \qquad \vec{r} = \vec{r}_0 + \vec{v}_0 t + \frac{1}{2}\vec{a}t^2 \qquad v^2 = v_0{}^2 + 2\vec{a}\bullet(\vec{r} - \vec{r}_0) \qquad v = r\omega$

$\omega_{avg} = \frac{\Delta\theta}{\Delta t} \qquad \alpha_{avg} = \frac{\Delta\omega}{\Delta t} \qquad x = x_0 + v_{0x}t + \frac{1}{2}a_x t^2 \qquad v_x{}^2 = v_{0x}{}^2 + 2a_x(x - x_0) \qquad a_t = \frac{dv_t}{dt} = r\alpha$

$\omega = \frac{d\theta}{dt} \qquad \alpha = \frac{d\omega}{dt} = \frac{d^2\theta}{dt^2} \qquad \theta = \theta_0 + \omega_0 t + \frac{1}{2}\alpha t^2 \qquad \omega^2 = \omega_0{}^2 + 2\alpha(\theta - \theta_0) \qquad a_r = \frac{v_t{}^2}{r} = \omega^2 r$

$I = \sum_i m_i r_i^2 \qquad I = \int_{\text{rigid body}} r^2 dm \qquad I = I_{\text{com}} + Mh^2 \qquad W = \int_{\theta_i}^{\theta_f} \tau d\theta \qquad K_{\text{final}} + U_{\text{final}} = K_{\text{initial}} + U_{\text{initial}} + W_{\text{nonconservative}}$

$\vec{\tau} = \vec{r} \times \vec{F} \qquad \tau = rF\sin\theta = rF_\perp = r_\perp F \qquad \tau_{net} = I\alpha \qquad K = \frac{1}{2}I\omega^2 \qquad P = \tau\omega \qquad W_{\text{total}} = K_{\text{final}} - K_{\text{initial}}$

$v_{\text{com}} = \omega r \qquad \vec{\ell} = \vec{r} \times \vec{p} = \vec{r} \times m\vec{v} \qquad \vec{L} = \sum \vec{\ell} \qquad \vec{\tau}_{net} = \frac{d\vec{L}}{dt} \qquad \frac{F}{A} = E\frac{\Delta L}{L}$

$a_{\text{com}} = \alpha r \qquad \ell = rp\sin\phi = rp_\perp = r_\perp p \qquad L_z = I\omega_z \qquad \frac{F}{A} = G\frac{\Delta x}{L} \qquad p = B\frac{|\Delta V|}{V}$

$F = -kx \qquad f = \frac{1}{T} = \frac{\omega}{2\pi} \qquad a(t) = -\omega^2 x(t) \qquad x(t) = x_m\cos(\omega t + \phi) \qquad U = \frac{1}{2}kx^2$

$T = 2\pi\sqrt{\frac{m}{k}} \qquad T = 2\pi\sqrt{\frac{I}{mgh}}$

$y(x,t) = h(x \pm vt) \qquad y(x,t) = y_m\sin(kx \pm \omega t + \phi) \qquad v = \lambda f = \frac{\omega}{k} \qquad k = \frac{2\pi}{\lambda}$

$v = \sqrt{\frac{F_T}{\mu}} \qquad P_{avg} = \frac{1}{2}\mu v\omega^2 y_m^2 \qquad y(x,t) = 2y_m\sin(kx)\cos(\omega t) \qquad f_n = nf_1\ ;\ \lambda_n = \frac{2L}{n}\ ;\ n = 1,2,3,4,5\ldots$

$y(x,t) = 2y_m\cos\left(\frac{\phi}{2}\right)\sin\left(kx - \omega t - \frac{\phi}{2}\right)$

$\frac{\phi}{2\pi} = \frac{\Delta L}{\lambda} \qquad I = \frac{P}{A} \qquad I = \frac{P}{4\pi r^2} \qquad I = \frac{1}{2}\rho v\omega^2 s_m^2 \qquad v = \sqrt{\frac{B}{\rho}}$

$\Delta p(x,t) = \Delta p_{\max}\sin(kx - \omega t) \qquad s(x,t) = s_{\max}\cos(kx - \omega t) \qquad \Delta p_{\max} = \rho v\omega s_m$

$\beta = 10\,\text{dB}\ \log\frac{I}{I_0} \qquad I_0 = 10^{-12}\frac{\text{W}}{\text{m}^2} \qquad f' = f\frac{v \pm v_D}{v \pm v_s}$

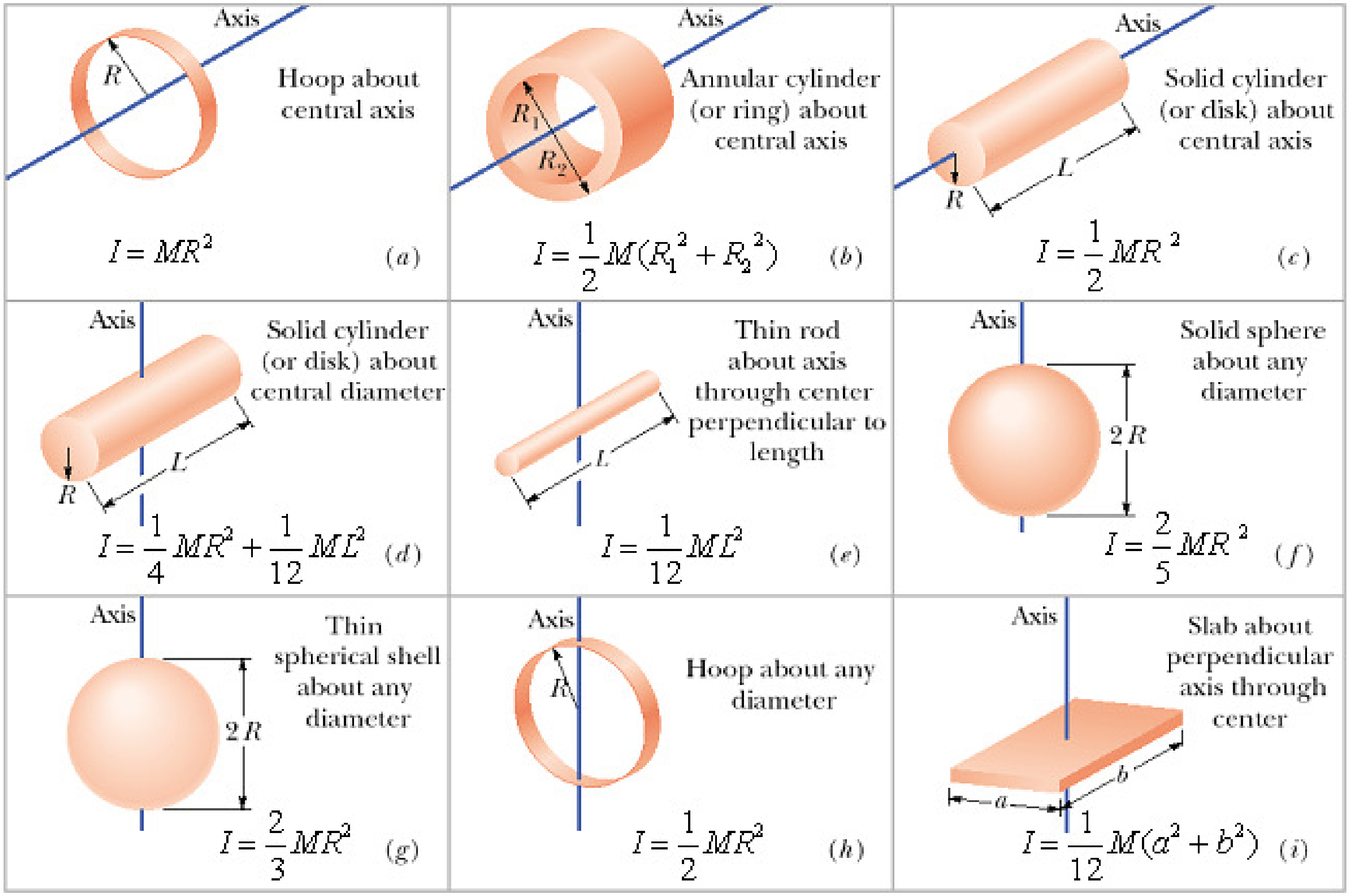
$y(x,t) = 2y_m\cos\left(\frac{\Delta k}{2}x - \frac{\Delta\omega}{2}t\right)\sin\left(k_{avg}x - \omega_{avg}t\right) \qquad f_{beat} = |f_2 - f_1|$

$n = \frac{c}{v} \qquad n_1\sin\theta_1 = n_2\sin\theta_2 \qquad \frac{1}{f} = \frac{1}{p} + \frac{1}{i} \qquad m = -\frac{i}{p} \qquad m = \frac{h'}{h}$

$d\sin\theta = m\lambda \qquad m = 0,\ \pm 1,\ \pm 2,\ \ldots\ \text{(constructive)} \qquad I = 4I_0\left[\cos(\phi/2)\right]^2 \qquad \phi = \frac{2\pi d}{\lambda}\sin\theta$

$a\sin\theta = m\lambda \qquad m = \pm 1,\ \pm 2,\ \pm 3,\ \ldots\ \text{(destructive)} \qquad I = I_m\left[\frac{\sin(\phi/2)}{\phi/2}\right]^2 \qquad \phi = \frac{2\pi a}{\lambda}\sin\theta$

$\tan\theta_B = \frac{n_2}{n_1} \qquad I = I_0\cos^2\theta$



Axis
R
Hoop about central axis
I = MR²
(a)
Axis
R₁
R₂
Annular cylinder (or ring) about central axis
I = ½M(R₁² + R₂²)
(b)
Axis
R
L
Solid cylinder (or disk) about central axis
I = ½MR²
(c)
Axis
R
L
Solid cylinder (or disk) about central diameter
I = ¼MR² + 1/12 ML²
(d)
Axis
L
Thin rod about axis through center perpendicular to length
I = 1/12 ML²
(e)
Axis
2R
Solid sphere about any diameter
I = 2/5 MR²
(f)
Axis
2R
Thin spherical shell about any diameter
I = 2/3 MR²
(g)
Axis
R
Hoop about any diameter
I = ½MR²
(h)
Axis
a
b
Slab about perpendicular axis through center
I = 1/12 M(a² + b²)
(i)