

NAME _____

Please do not open until instructed to do so.

Make sure you have filled out your SCAN CARD as instructed.

$$\theta(t) = \theta_0 + \omega_0 t + \frac{1}{2} \alpha t^2$$

$$\omega(t) = \omega_0 + \alpha t$$

$$v = r\omega$$

$$a = r\alpha$$

$$I = \sum m_i r_i^2 = \int r^2 dm$$

$$I_{||} = I_{cm} + MD^2$$

$$KE_{\text{rotation}} = \frac{1}{2} I \omega^2$$

$$\vec{\tau} = \vec{r} \times \vec{F}$$

$$|\vec{\tau}| = |\vec{r}| |\vec{F}| \sin(\theta)$$

$$\sum \vec{F} = m\vec{a}$$

$$\sum \vec{\tau} = I\vec{\alpha}$$

Table 9.2 on back of this page.

$$at^2 + bt + c = 0$$
$$t = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\rho = \frac{\text{mass}}{\text{Volume}}$$

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$

$$P = P_0 + \rho gh$$

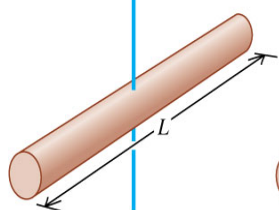
$$A_1 v_1 = A_2 v_2$$

$$P + \frac{1}{2} \rho v^2 + \rho gh = \text{constant}$$

Table 9.2 Moments of Inertia of Various Bodies

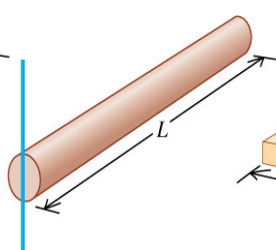
(a) Slender rod,
axis through center

$$I = \frac{1}{12} ML^2$$



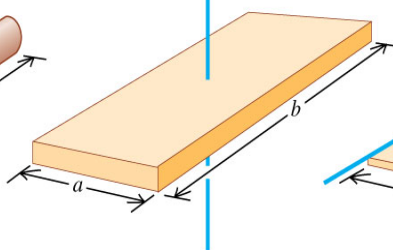
(b) Slender rod,
axis through one end

$$I = \frac{1}{3} ML^2$$



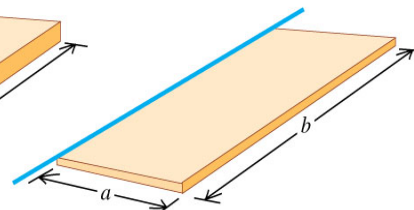
(c) Rectangular plate,
axis through center

$$I = \frac{1}{12} M(a^2 + b^2)$$



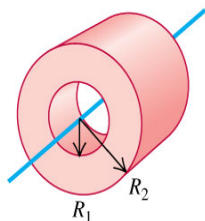
(d) Thin rectangular plate,
axis along edge

$$I = \frac{1}{3} Ma^2$$



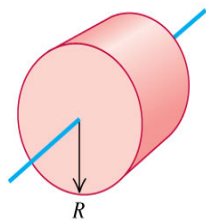
(e) Hollow cylinder

$$I = \frac{1}{2} M(R_1^2 + R_2^2)$$



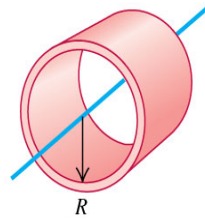
(f) Solid cylinder

$$I = \frac{1}{2} MR^2$$



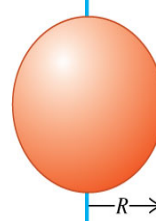
(g) Thin-walled hollow
cylinder

$$I = MR^2$$



(h) Solid sphere

$$I = \frac{2}{5} MR^2$$



(i) Thin-walled hollow
sphere

$$I = \frac{2}{3} MR^2$$

