

Physics 190 Formula Sheet 4

Rotational Inertia:

Thin Hoop $I_{\text{cm}} = m r^2$

Thick Hoop $I_{\text{cm}} = \frac{1}{2} m (r_1^2 + r_2^2)$

Disk/Cylinder $I_{\text{cm}} = \frac{1}{2} m r^2$

Rectangular Plate $I_{\text{cm}} = \frac{1}{2} m (L^2 + W^2)$

Rod about its center $I_{\text{cm}} = \frac{1}{12} m L^2$

Rod about its end $I = \frac{1}{3} m L^2$

Solid Sphere $I_{\text{cm}} = \frac{2}{5} m r^2$

Thin Spherical Shell $I_{\text{cm}} = \frac{2}{3} m r^2$

Parallel-axis theorem: $I = I_{\text{cm}} + m d^2$