MOMENT OF INERTIA FOR VARIOUS BODIES OF MASS

The mass of the body is indicated by m

Body	Axis	Moment of inertia
Uniform thin rod of length l	Normal to the length, at one end	$m\frac{1}{3}l^2$
Uniform thin rod of length l	Normal to the length, at the center	$m\frac{1}{12}l^2$
Thin rectangular sheet, sides a and b	Through the center parallel to b	$m\frac{1}{12}a^2$
Thin rectangular sheet, sides a and b	Through the center perpendicular to the sheet	$m\frac{1}{12}(a^2+b^2)$
Thin circular sheet of radius r	Normal to the plate through the center	$m\frac{1}{2}r^2$
Thin circular sheet of radius r	Along any diameter	$m\frac{1}{4}r^2$
Thin circular ring. Radii r_1 and r_2	Through center normal to plane of ring	$m\frac{1}{2}(r_1^2+r_2^2)$
Thin circular ring. Radii r_1 and r_2	Any diameter	$m\frac{1}{4}(r_1^2+r_2^2)$
Rectangular parallelepiped, edges a, b, and c	Through center perpendicular to face ab, (parallel to edge c)	$m\frac{1}{12}(a^2+b^2)$
Sphere, radius r	Any diameter	$m\frac{2}{5}r^2$
Spherical shell, external radius, r_1, internal radius r_2	Any diameter	$m\frac{2}{5}\frac{(r_1^5-r_2^5)}{(r_1^3-r_2^3)}$
Spherical shell, very thin, mean radius, r	Any diameter	$m\frac{2}{3}r^2$
Right circular cylinder of radius r, length l	The longitudinal axis of the solid	$m\frac{1}{2}r^2$
Right circular cylinder of radius r, length l	Transverse diameter	$m\left(\frac{r^2}{4}+\frac{l^2}{12}\right)$
Hollow circular cylinder, length l, radii r_1 and r_2	The longitudinal axis of the figure	$m\frac{1}{2}(r_1^2+r_2^2)$
Thin cylindrical shell, length l, mean radius, r	The longitudinal axis of the figure	mr^2
Hollow circular cylinder, length l, radii r_1 and r_2	Transverse diameter	$m\left(\frac{r_1^2+r_2^2}{4}+\frac{l^2}{12}\right)$
Hollow circular cylinder, length l, very thin, mean radius r	Transverse diameter	$m\left(\frac{r^2}{2}+\frac{l^2}{12}\right)$
Elliptic cylinder, length l, transverse semiaxes a and b	Longitudinal axis	$m\frac{1}{4}(a^2+b^2)$
Right cone, altitude h, radius of base r	Axis of the figure	$m\frac{3}{10}r^2$
Spheroid of revolution, equatorial radius r	Polar axis	$m\frac{2}{5}r^2$
Ellipsoid, axes $2a$, $2b$, $2c$	Axis $2a$	$m\frac{1}{5}(b^2+c^2)$