Table 8.1 Rotational Inertia for Uniform Objects with Various Geometrical Shapes

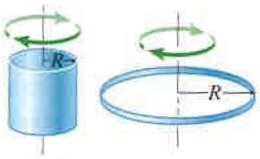
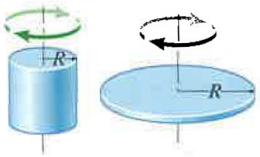
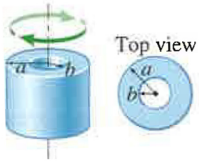
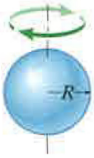
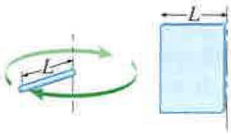
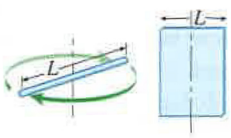
Shape	Axis of Rotation	Rotational Inertia
Thin hollow cylindrical shell (or hoop) 	Central axis of cylinder	MR^2
Solid cylinder (or disk) 	Central axis of cylinder	$\frac{1}{2}MR^2$
Hollow cylindrical shell or disk 	Central axis of cylinder	$\frac{1}{2}M(a^2 + b^2)$
Rectangular plate 	Perpendicular to plate through center	$\frac{1}{12}M(a^2 + b^2)$
Solid sphere 	Through center	$\frac{2}{5}MR^2$
Thin hollow spherical shell 	Through center	$\frac{2}{3}MR^2$
Thin rod (or rectangular plate) 	Perpendicular to rod through end (or along edge of plate)	$\frac{1}{3}ML^2$
Thin rod (or rectangular plate) 	Perpendicular to rod through center (or parallel to edge of plate through center)	$\frac{1}{12}ML^2$

Table 9.1 Densities of Common Substances (at 0°C and 1 atm unless otherwise indicated)

Gases	Density (kg/m^3)	Liquids	Density (kg/m^3)	Solids	Density (kg/m^3)
Hydrogen	0.090	Gasoline	680	Polystyrene	100
Helium	0.18	Ethanol	790	Cork	240
Steam (100°C)	0.60	Oil	800–900	Wood (pine)	350–550
Nitrogen	1.25	Water (0°C)	999.87	Wood (oak)	600–900
Air (20°C)	1.20	Water (3.98°C)	1000.00	Ice	917
Air (0°C)	1.29	Water (20°C)	1001.80	Wood (ebony)	1000–1300
Oxygen	1.43	Seawater	1025	Bone	1500–2000
Carbon dioxide	1.98	Blood (37°C)	1060	Concrete	2000
		Mercury	13 600	Quartz, granite	2700
				Aluminum	2702
				Iron, steel	7860
				Copper	8920
				Lead	11 300
				Gold	19 300
				Platinum	21 500

(a)

P_1A