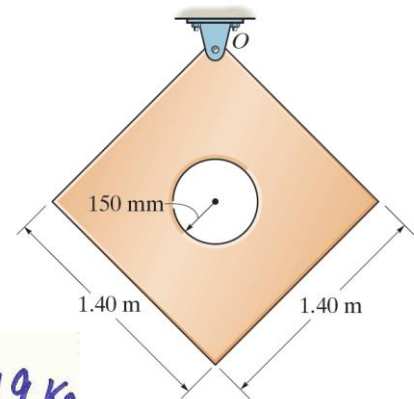


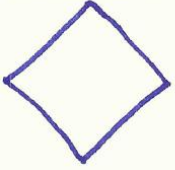

Problem 2 – Intro to Kinetics
MASS MOMENT OF INERTIA

Determine the moment of inertia about an axis perpendicular to the page and passing through the pin at O . The thin plate has a hole in its center. Its thickness is 50 mm, and the material has a density $\rho = 50 \text{ kg/m}^3$.



$$M_{\text{PLATE}} = 50 \text{ kg/m}^3 (1.4 \text{ m} \times 1.4 \text{ m} \times 0.05 \text{ m}) = 4.9 \text{ kg}$$

$$M_{\text{HOLE}} = 50 \text{ kg/m}^3 (\pi (0.15 \text{ m})^2 (0.05 \text{ m})) = 0.1767 \text{ kg}$$

SHAPE	I_G	md^2	$I_G + md^2$
	$\frac{1}{12} m(a^2 + b^2)$ $\frac{1}{12} (4.9)(1.4^2 + 1.4^2)$ $= 1.6$	$4.9(.99)^2$ $= 4.8$	6.4
	$\frac{1}{2} mr^2$ $\frac{1}{2} (.1767)(.15)^2$ $= 0.00199$	$0.1767(.99)^2$ $= 0.173$	- 0.175
			<u>6.23</u>

$$\underline{I_O = 6.23 \text{ kg m}^2}$$