Problem 1 – Intro to Kinetics
MASS MOMENT OF INERTIA

The pendulum shown below consists of two thin rods each weighing 10 lbs.
Compute the pendulum's mass moment of inertia about an axis passing through:

(a) the pin at O.
(b) the mass center, G, of the pendulum.

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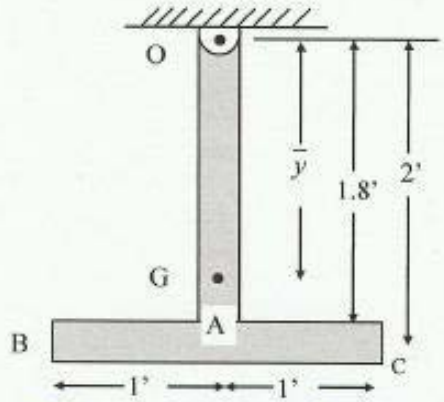
$I_G = \frac{1}{12} m l^2$



SHAPE	$\bar{y}$	MASS	$\bar{y}m$
	0.9	$10/g$	$9/g$
	2.0	$10/g$	$20/g$
Σ		$20/g$	$29/g$

$\bar{Y} = \frac{\Sigma \bar{y} m}{\Sigma m} = \frac{29/g}{20/g} = 1.45'$

ABOUT G

I_G	md^2	$I_G + md^2$
0.084	$\frac{10}{g}(1.45-0.9)^2$	0.1781
0.1037	$\frac{10}{g}(2-1.45)^2$	0.1977
		Σ 0.376 SLUG-FT

ABOUT O

I_G	md^2	$I_G + md^2$
0.084	$\frac{10}{g}(0.9)^2$	0.336
0.1037	$\frac{10}{g}(2)^2$	1.348
		Σ 1.681 SLUG-FT