ME 205 – STATICS – FALL 2014
SECTION 04

HOMEWORK #7

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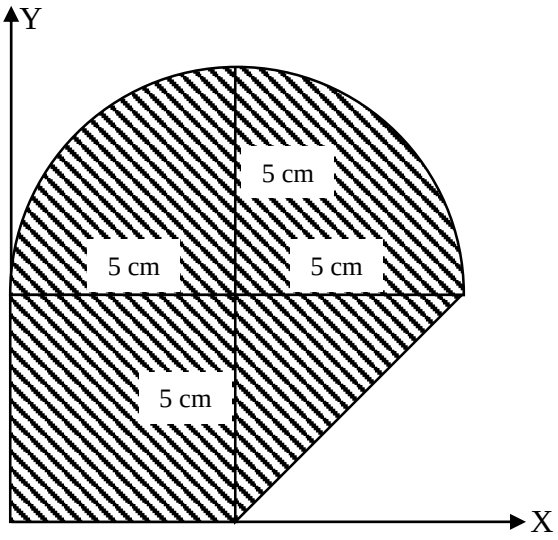
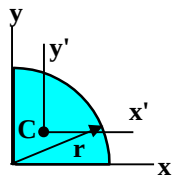
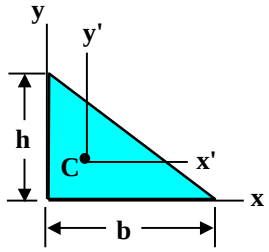
Date: 31.12.2014
Due: 09.01.2015 (Final Exam)

Problem

Locate the centroid of the given area. Then, find the moments of inertia, $\bar{I}_{xx}$, $\bar{I}_{yy}$ with respect to its centroid.



Hint:

Quarter circular Area 	$\bar{x} = \bar{y} = \frac{4r}{3\pi}$ $A = \frac{1}{4}\pi r^2$ $P = r(2 + \frac{1}{2}\pi)$	$I_x = I_y = \frac{1}{16}\pi r^4$ $I_{x'} = I_{y'} = \frac{9\pi^2 - 64}{144\pi} r^4$
Right Triangle 	$\bar{x} = \frac{1}{3}b$ $\bar{y} = \frac{1}{3}h$ $A = \frac{1}{2}bh$ $P = b + h + \sqrt{b^2 + h^2}$	$I_x = \frac{1}{12}bh^3$ $I_y = \frac{1}{12}b^3h$ $I_{x'} = \frac{1}{36}bh^3$ $I_{y'} = \frac{1}{36}b^3h$