TEST 2

All three problems are of equal weight, and will be graded on a scale of 0-20.

1. Block B moves to the right at a constant speed of 600 mm/s, and end A of the bar is held stationary (v_A=0.) Determine the angular acceleration and angular velocity the bar when θ=30°.
2. (a) Use the method of integration to determine $I_{zz}$ in terms of the density, $\rho$.
(b) Use the parallel axis theorem to find $I_{zz}'$, where the $z'$ axis passes through the centroid, located at $(0, 4r/3\pi, 0)$ in the xyz axes shown.

\[ I_{zz} = \frac{1}{4} \rho \pi r^4 h \]
3. The solid, homogenous, semi-cylindrical Godzilla-crushing device is tested for use in future examinations that include impact problems. It is released from rest in the position shown. Determine its angular speed when its mass center is at its lowest point. Assume rolling without slipping.