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MICHIGAN STATE UNIVERSITY

PHY422/820: Classical Mechanics

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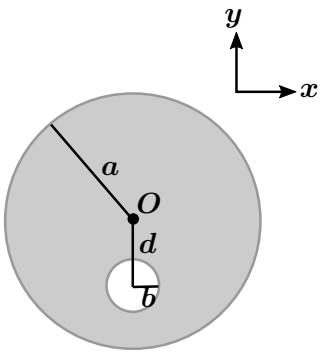
Exam Preparation

December 1, 2020

Problem P11 – Cylinder with a Bore

We consider a homogenous cylinder of density ρ_0 with a cylindrical bore, as shown in the figure. The outer radius of the cylinder is a, the radius of the bore is b, and the centers of the two cylinders are offset by a distance d. The height of the cylinder is H. Compute the moment of inertia tensor of the cylinder for rotations around axes through the point O.



HINT: Note that moments of inertia are additive (or subtractive).