

MECH230 - Fall 2024

Recommended Problems - Set 15

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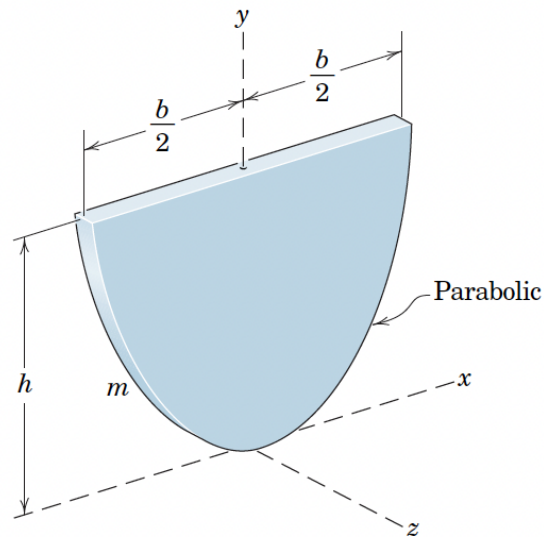
November 11, 2024

[Center of Mass](#)

These problems are taken from J. L. Meriam, L. G. Kraige, and J. N. Bolton (MKB), Engineering Mechanics: Dynamics, Ninth Edition, Wiley, New York, 2018.

1. [MKB B-004]

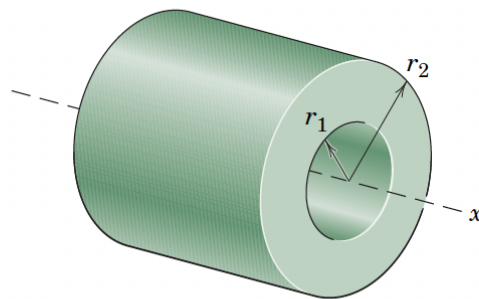
B/4 Determine the mass moment of inertia of the uniform thin parabolic plate of mass m about the x -axis. State the corresponding radius of gyration.



PROBLEM B/4

2. [MKB B-029]

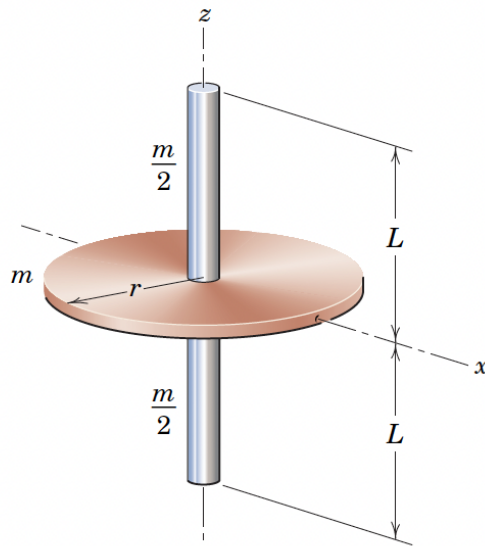
B/29 Determine I_{xx} for the cylinder with a centered circular hole. The mass of the body is m .



PROBLEM B/29

3. [B-032]

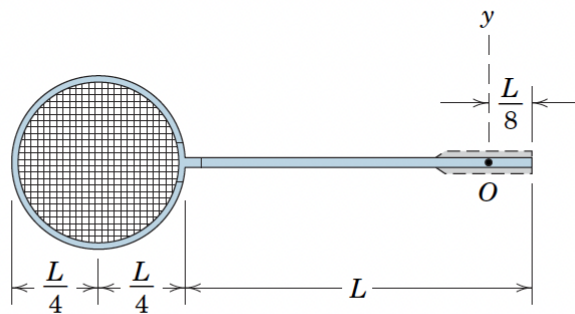
B/32 Determine the length L of each of the slender rods of mass $m/2$ which must be centrally attached to the faces of the thin homogeneous disk of mass m in order to make the mass moments of inertia of the unit about the x - and z -axes equal.



PROBLEM B/32

4. [B-034]

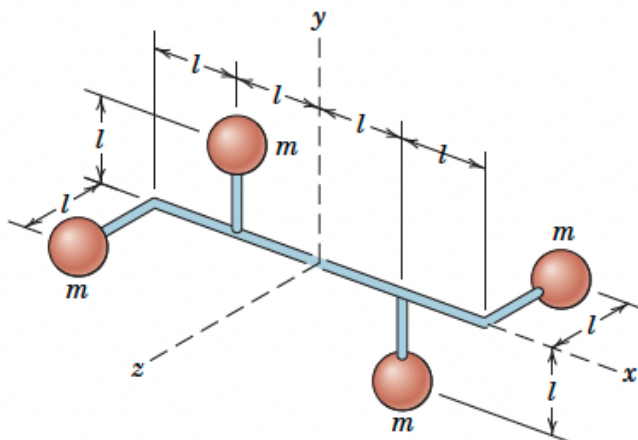
B/34 A badminton racket is constructed of uniform slender rods bent into the shape shown. Neglect the strings and the built-up wooden grip and estimate the mass moment of inertia about the y -axis through O , which is the location of the player's hand. The mass per unit length of the rod material is ρ .



PROBLEM B/34

5. [B-047]

B/47 Determine the products of inertia about the coordinate axes for the unit which consists of four small particles, each of mass m , connected by the light but rigid slender rods.



PROBLEM B/47