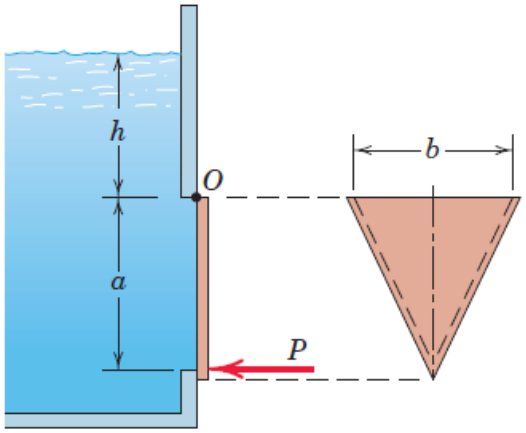
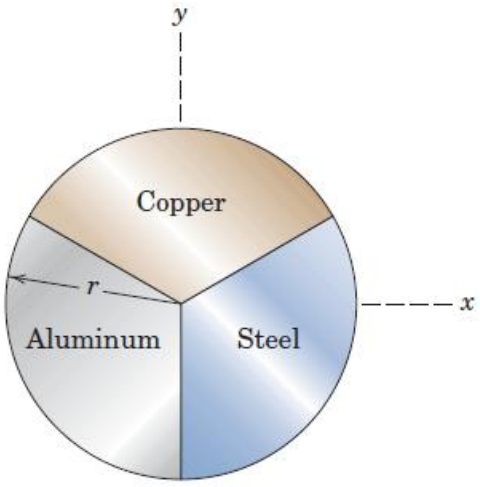
Istanbul Technical University - Faculty of Aeronautics and Astronautics
2017-2018 Summer Term
30700 STA201E Statics

Homework – 3

Problem 1: A flat plate seals a triangular opening in the vertical wall of a tank of liquid of density ρ. The plate is hinged about the upper edge O of the triangle. Determine the force P required to hold the gate in a closed position against the pressure of the liquid and the horizontal reaction at the hinge. Does the athmosperic pressure affect the result?

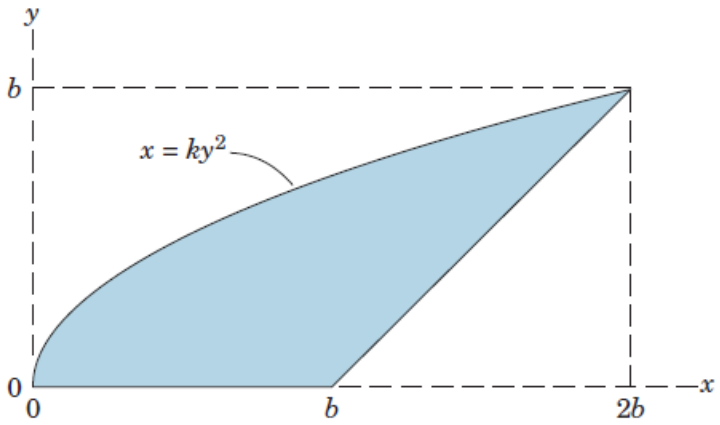


Problem 2: The disk of uniform thickness is composed of equal sectors of the materials shown. Determine the location of the mass center of the disk.



Problem 3: Consider the figure below.

(a) Locate the centroid of the shaded area.
(b) Calculate the volume V of the solid generated by revolving the shaded area through 180° about the x-axis. If this body were constructed of steel, what would be its mass m?



Problem 4: Determine the components of the reactions at A, B, C, D, and E for the loaded space frame shown. Each connection may be treated as a ball-and-socket joint.