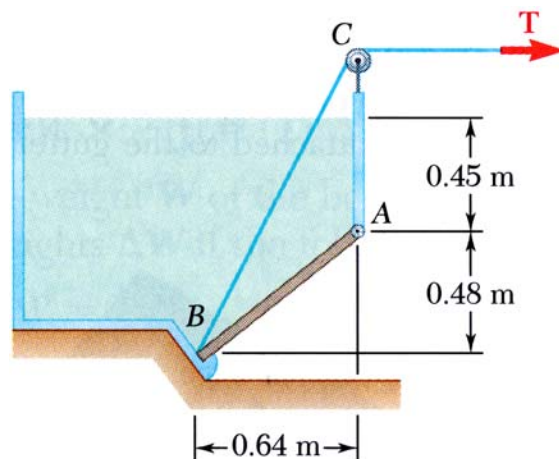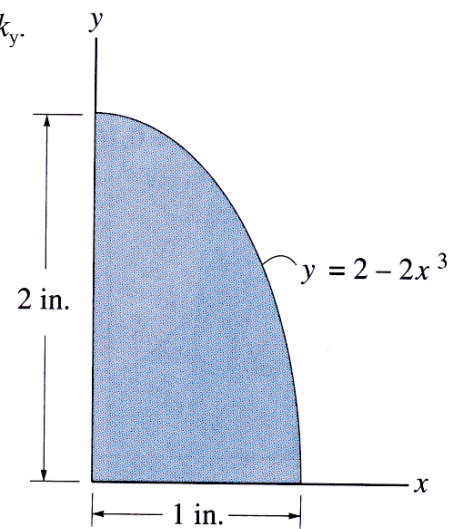1.   A 0.5 x 0.8-m gate *AB* is located at the bottom of a tank filled with water. The gate is hinged along its top edge *A* and rests on a frictionless stop at *B*. Determine the reaction at *B* when cable *BC* is slack. Assume the mass density of water is $D = 1000$ kg/m³.

2. Determine the radius of gyration of the shaded area about the y-axis, k_y.

$$y = 2 - 2x^3$$

2 in.

1 in.

3. Determine I_x, I_y, and I_{xy} for the cross-sectional area with respect to the x and y axes that have their origin located at O.
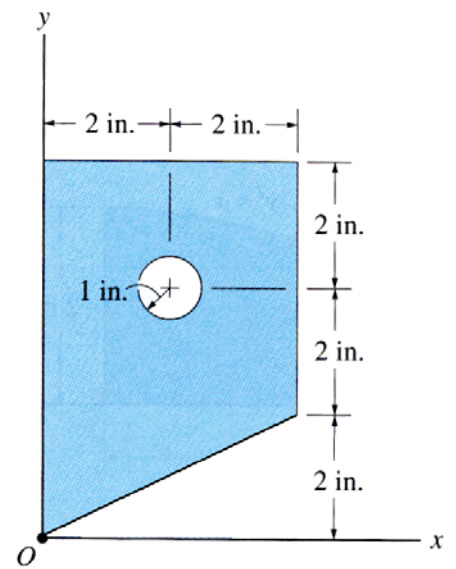
4. Part (a) – Determine the direction of the principal axes, 2_p, with origin located at C, and the principal moments of inertia, I_{xp} and I_{yp}, of the area about these axes. *(Note that this is the same area used in Problem 3.)*
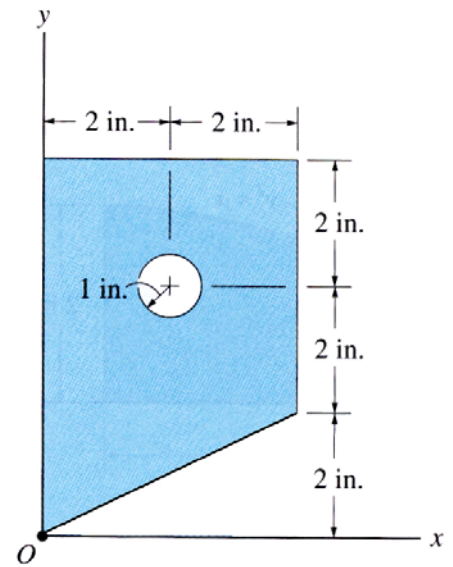
Part (b) – Draw Mohr's circle for the area above.