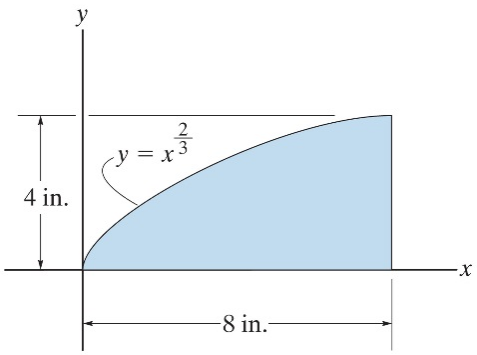
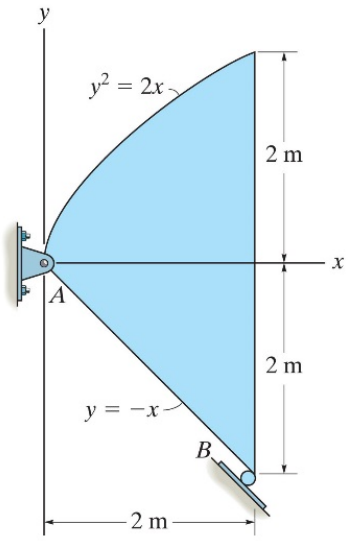
Chapter 9

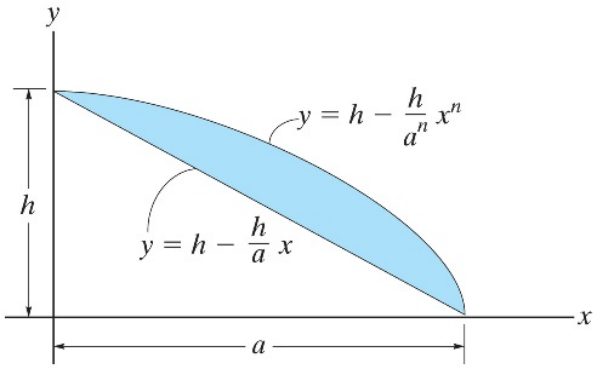
1. Locate the centroid ($\bar{x}$, $\bar{y}$) of the area.



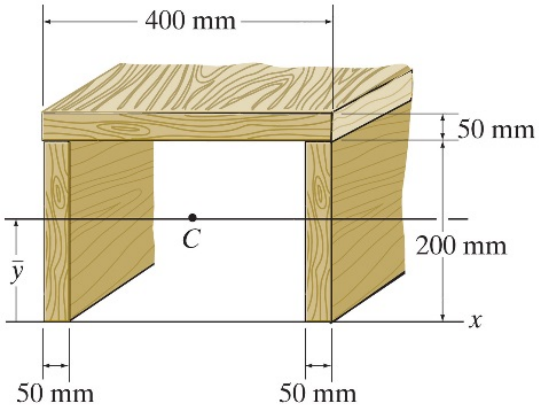
2. The steel plate is 0.3 m thick and has a mass density of 7850 kg/m^3.
   a) Determine the location of its center of mass ($\bar{x}$, $\bar{y}$).
   b) Find the reaction at the pin A and roller support B.



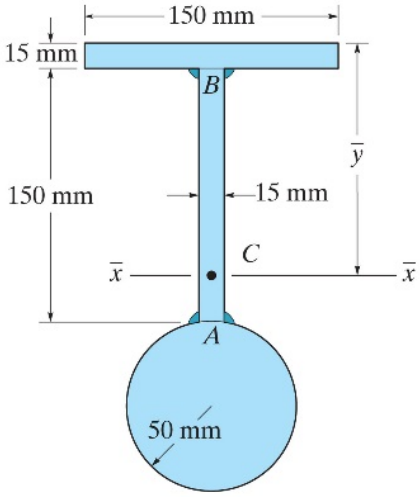
3. Locate the centroid ($\bar{x}$, $\bar{y}$) of the shaded area. set a = 3, h = 1 and n = 2.



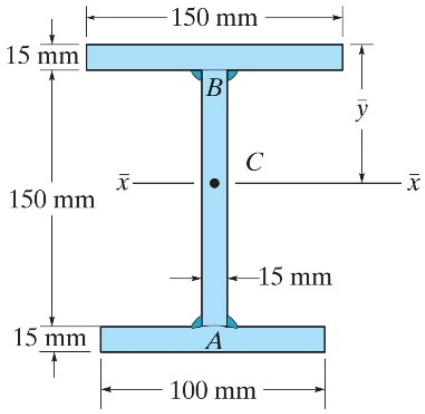
4. Locate the centroid $\bar{y}$ of the beam's cross-section area.

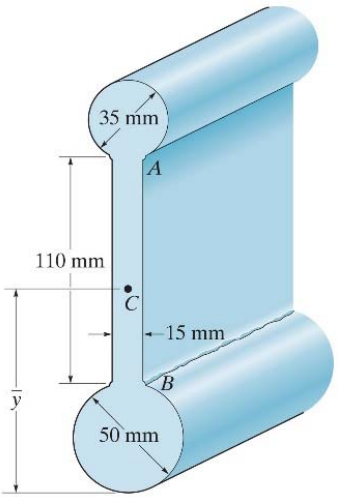


5. a) Determine the location $\bar{y}$ of the centroidal axis x-x of the beam's cross-sectional area.
   b) Determine the location $\bar{y}$ of the center of mass if the beam has mass per unit length $\rho = 12$ kg/m and the disk has the mass per area $\rho = 25$ kg/m^2.



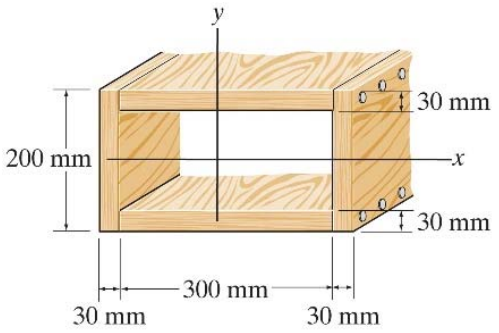
6. Determine the location $\bar{y}$ of the centroid of the beam's cross-section area.





Chapter 10

1. Determine the moment of inertia I_x and I_y of the beam's cross-sectional area about the centroidal x and y axes.

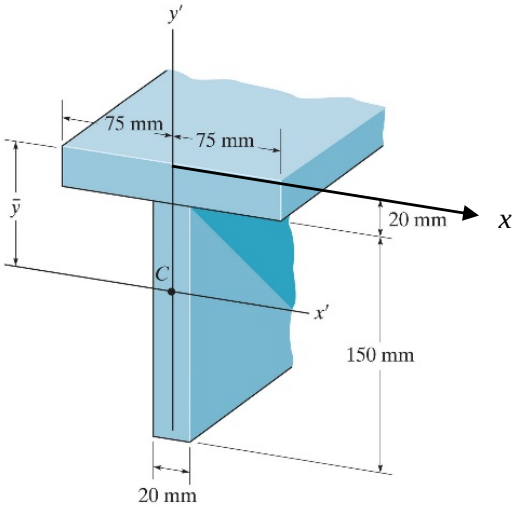


2. Continue problem 6 in chapter 9. Determine the moment of inertia I_x of the cross-sectional area about the centroidal x and y axes.

3. Determine the moment of inertia of area I_x.

a) Find the centriod of area $\bar{y}$ and calculate I_x about centroidal x' axis.

b) Find the I_x about x axis.



4. The pendulum consists of two slender rods AB and OC which have a mass of 3 kg/m. The thin plate has a mass of 12 kg/m^2.

a) Determine the location $\bar{y}$ of the center of mass G of the pendulum, then calculate the mass moment of inertia of the pendulum about z axis passing through G.

b) Calculate the mass moment of inertia about z axis passing the rotation center O.