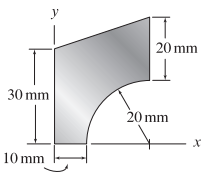
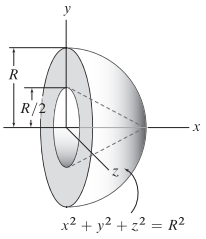
For the area shown, use composite shapes to determine the x and y positions of the centroid.



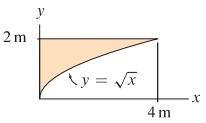
The solid shown consists of a hemisphere with a conical cavity. Use composite shapes to determine the x, y, and z locations of the centroid. Express your answers in terms of R.



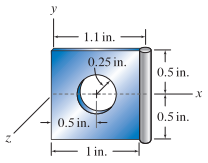
For the area shown, use integration to determine the x and y positions of the centroid.

(a) Use a horizontal area element.

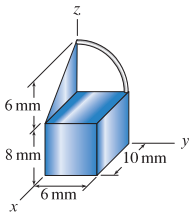
(b) Use a vertical area element.



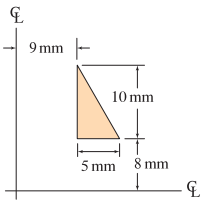
A square plate having $1.25\,\text{lb/in.}^2$ weight has a circular hole. Along the right-hand edge of the plate, a circular cross section rod having $0.75\,\text{lb/in.}$ weight is welded to it. Determine the x position of the center of gravity.



The object shown consists of a rectangular solid, a plate and a quarter-circular wire, with masses as follows: solid: $0.0005\,\text{g/mm}^3$, plate: $0.01\,\text{g/mm}^2$, wire: $0.05\,\text{g/mm}$. Determine the coordinates of the center of mass.



A solid is produced by rotating a triangular area 360° about the vertical axis of revolution shown. Determine the volume and surface area of the solid.

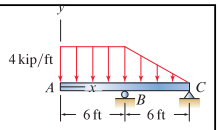


(a) For the distributed loading shown, develop an expression (or multiple expressions if needed) for the distributed force w as a function of position x.

(b) Use integration (Eqs. (7.41) and (7.43) on p. 433) with the results of Part (a) to determine the total force produced by the distributed load and the x position of its line of action.

(c) Determine the support reactions using the results of Part (b).

(d) Determine the support reactions using composite shapes for the distributed load.



A uniform curved beam with circular shape and weight W has a built-in support at A. Determine the support reactions. Express your answers in terms of parameters such as W and R.