1. Determine the internal normal force, shear force, and moment at points $C$ and $D$ of the beam.
2. Determine the maximum moment and where it occurs in the beam.
3. The spool has a mass of 200 kg and rests against the wall and on the floor. If the coefficients of static friction at A and B are $\mu_A = 0.4$ and $\mu_B = 0.5$, respectively, determine the smallest vertical force $P$ that must be applied to the cable that will cause the spool to turn.
4. Locate the centroid \((x, y)\) of the shaded area.