Problem 1 (5 points). The figure below shows a rigid bar that is supported by a pin at A and two rod, one made of steel and the other of bronze. Neglecting the weight of the bar, compute the stress in each rod caused by the 50 kN load, using the following data:

**Steel**: Area: 600 mm², E: 200 GPa

**Bronze**: Area: 300 mm², E: 83 GPa

Solution:
Problem 2 (5 points). A steel bar passes through a brass sleeve; both are fixed at the two ends by rigid plates. The assembly has no stress at $40^\circ F$, and then the temperature of both are steadily increased. Which of the two (steel or brass) would fail first, and at what temperature?

Use the following data (the allowable stresses are same in compression and tension):

**Steel:** $L:12in, Area:0.785in^2, \ V:30,000ksi, \ \alpha:6.6*10^{-6}/^\circ F, \ \sigma_{allowable}:30ksi$

**Brass:** $L:12in, Area:1.767in^2, \ V:15,000ksi, \ \alpha:9.8*10^{-6}/^\circ F, \ \sigma_{allowable}:10ksi$

**Solution:**