1. If the beam has a square cross section of 9 in. on each side, determine the maximum bending stress $\sigma$ (absolute value) in the beam.
2. The composite beam is made of steel (A) and brass (B). If the allowable bending stress for the steel is $\sigma_s = 180 \text{ MPa}$ and for the brass $\sigma_b = 60 \text{ MPa}$, determine the maximum moment $M$ that can be applied to the beam. Assume $E_s = 200 \text{ GPa}$ and $E_b = 101 \text{ MPa}$.
3. If the applied shear force $V = 18$ kips, determine the maximum shear stress $\tau$ in the beam.
4. If nails having a shear strength of 40 lb are spaced at 9 in., determine the largest vertical shear force $V$ that can supported by the beam so that the fasteners will not fail.