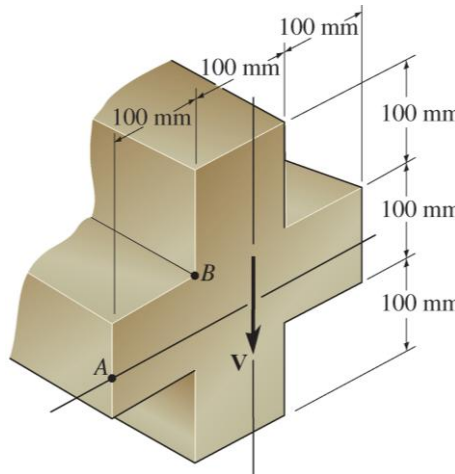
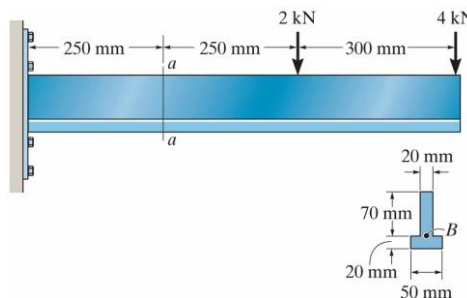


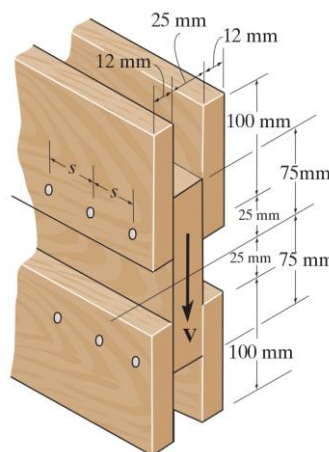
1. Determine the shear stress at points A and B if the beam is subjected to a shear force of $V=600$ kN. [15%] Ans: 11.4, 24.8 MPa



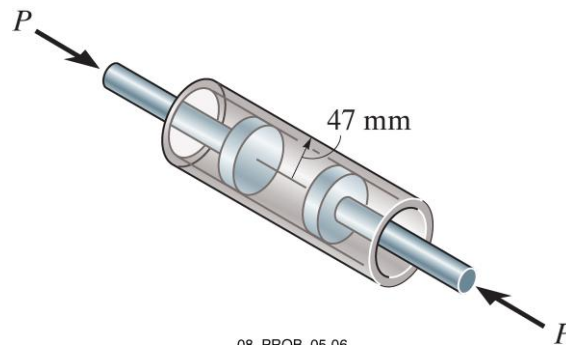
2. (a) Determine the shear stress at point B on the web of the cantilevered strut at section $a-a$. [10%] Ans: 4.41 MPa
 (b) Determine the maximum shear stress acting at section $a-a$ of the cantilevered strut. [10%] Ans: 4.85 MPa



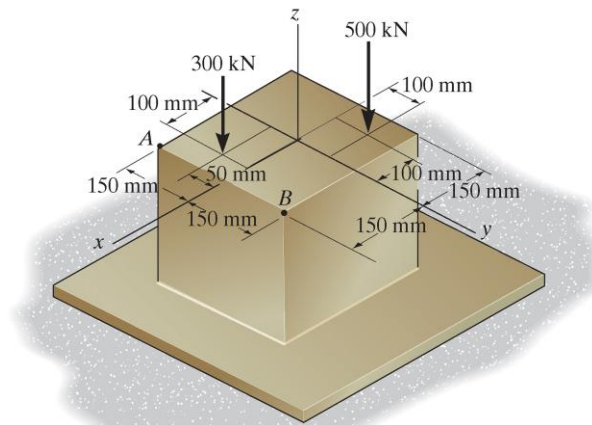
3. The boards are bolted together to form the built-up beam. If the beam is subjected to a shear force of $V=75$ kN, determine the maximum spacing s of the bolts. Each bolt has a shear strength of 30 kN. [15%] Ans: 169 mm



4. (a) A pressurized spherical tank is to be made of 12-mm-thick steel. If it is subjected to an internal pressure of $p=1.4$ MPa, determine its radius (or inner radius) if the maximum normal stress is not to exceed 105 MPa. [7%] Ans:1.8 m
 (b) Air pressure in the cylinder is increased by exerting forces $P=2$ kN on the two pistons, each having a radius of 45 mm. If the cylinder has a wall thickness of 2 mm, determine the hoop and axial stresses. [8%] Ans:7.07, 0 MPa



5. Determine the normal stress developed at points A and B of the column. [15%]
 Ans:3.33, -12.22 MPa



6. Determine the state of stress at point A on the cross section of the pipe at section $a-a$. [20%] Ans:0, 11.3 MPa

