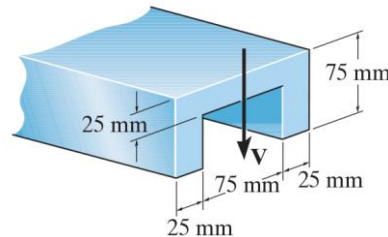
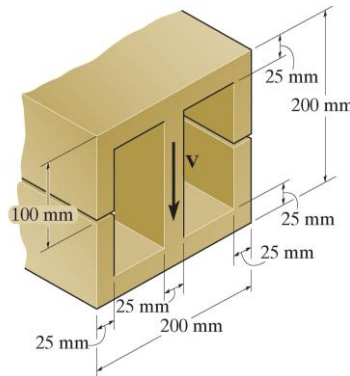


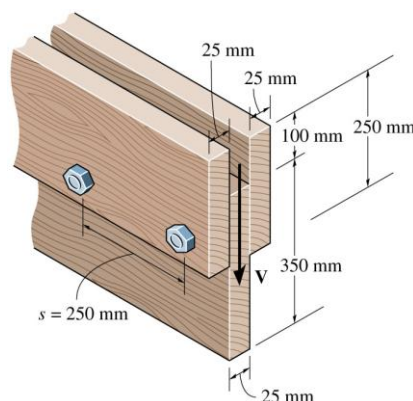
1. If the applied shear force  $V=90$  kN, determine the maximum shear stress in the member. [15%] Ans:35.9 MPa



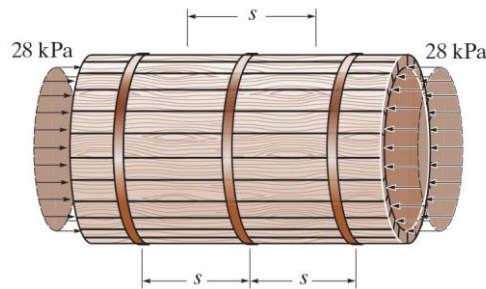
2. The beam is to be cut longitudinally (沿著長軸向切開) along both sides (兩邊) as shown. If it is subjected to a shear of  $V=250$  kN, compare the maximum shear stress in the beam before and after the cuts were made(切之前及之後). [15%] Ans:22.0, 66.0 MPa



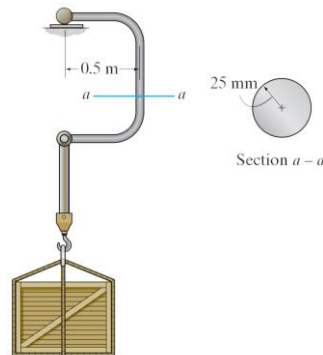
3. A beam is constructed from three boards bolted together as shown. Determine the shear force developed in each bolt (螺栓) if the bolts are spaced  $s = 250$  mm apart and the applied shear is  $V = 35$  kN. [15%] Ans:12.5 kN



4. A wood pipe having an inner diameter (內直徑) of 0.9 m is bound together using steel hoops (鋼環) each having a cross sectional area (截面積) of  $125 \text{ mm}^2$ . If the allowable stress for the hoops is  $\sigma_{allow} = 84 \text{ MPa}$ , determine their maximum spacing  $s$  along the section of pipe so that the pipe can resist (承受) an internal gauge pressure (內淨壓力) of 28 kPa. Assume each hoop supports the pressure loading acting along the length  $s$  of the pipe (假設每個環可承受  $s$  範圍內的內淨壓力). [15%] Ans: 0.833 m



5. If the load has a weight (重) of 2700 N, determine the maximum normal stress developed on the cross section (截面) of the supporting member at section  $a-a$ . [20%] Ans: 111 MPa (tension)



6. The rod has a diameter of 40 mm. If it is subjected to the force system shown, determine the stress components that act at point A. Note that there is a torsional moment  $100 \text{ N} \cdot \text{m}$  shown in the figure. [20%] Ans: 37.0 MPa, -7.32 MPa (shear)

