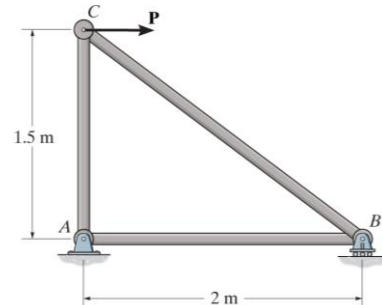
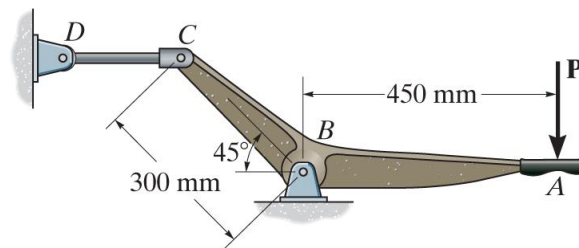


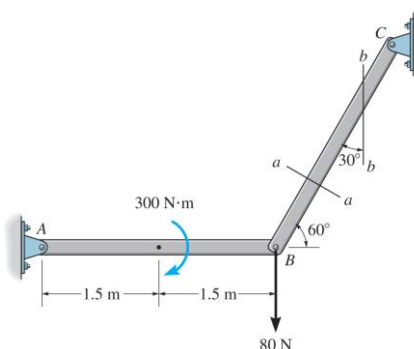
1. Determine the average normal stress in each of the 20-mm diameter (直徑) bars of the truss. Set $P=40$ kN. (bar AB , AC , BC) [15%] Ans: 127, 95.5, 159 MPa



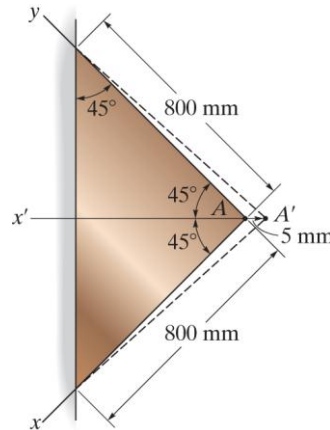
2. (a) A vertical force of $P=1500$ N is applied to the bell crank. Determine the average normal stress developed in the 10-mm diameter rod CD , and the average shear stress developed in the 6-mm diameter pin B that is subjected to double shear. (b) Determine the maximum vertical force P so that the average normal stress developed in the 10-mm diameter rod CD not exceeds 175 MPa and the average shear stress developed in the 6-mm diameter pin B not exceeds 75 MPa. [20%] Ans: (a) 45.5, 62.2 MPa (b) 1808 N



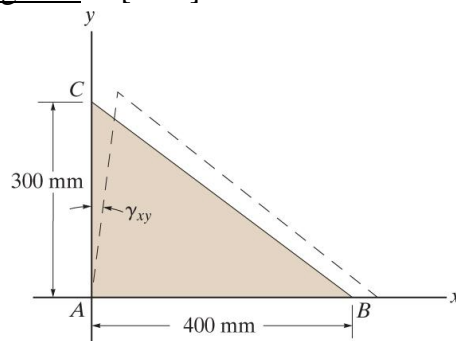
3. The two-member frame is subjected to the loading shown. Determine the average normal stress and the average shear stress acting at sections $a-a$ and $b-b$. Member CB has a square cross section of 50 mm on each side. (50x50 mm) [15%] Ans: (a-a) 83.12, 0 kPa, (b-b) 20.78, 36 kPa



4. The triangular plate is fixed at its base, and its apex A is given a horizontal displacement of 5 mm. (a) Determine the shear strain at corner A . (b) Determine the average normal strain along the x axis. (c) Determine the average normal strain along the x' axis. [20%] Ans: (a) 0.0088 rad (b) 0.00443 (c) 0.00884



5. The triangular plate ABC is deformed into the shape shown by the dashed lines. If at A , $\epsilon_{AB} = 0.0075$, $\epsilon_{AC} = 0.01$, and $\gamma_{xy} = 0.005$ rad, determine the average normal strain along edge BC . [15%] Ans: 0.00598



6. The piece of plastic is originally rectangular and is deformed into the shape shown by the dashed lines. Determine the average normal strain along diagonals AC and BD . [15%] Ans: 0.0016, 0.0128

