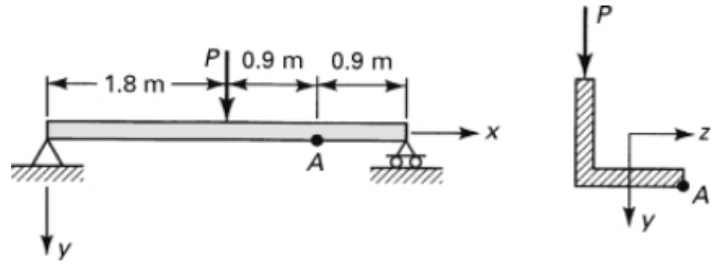
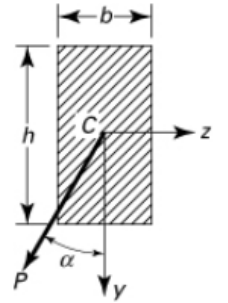


Homework 8

- 1) A simply supported beam constructed of a $0.15 \times 0.15 \times 0.015 \text{ m}$ angle is loaded by concentrated force $P = 22.5 \text{ kN}$ at its midspan. Calculate stress σ_x at A and the orientation of the neutral axis. Neglect the effect of shear in bending and assume that beam twisting is prevented.



- 2) A wood cantilever beam with the cross section shown is subjected to an angled (as shown) load P at its free end. Determine (a) the orientation of the neutral axis; (b) the maximum bending stress. Given: $P = 1 \text{ kN}$, $\alpha = 30^\circ$, $b = 80 \text{ mm}$, $h = 150 \text{ mm}$, and length $L = 1.2 \text{ m}$.



- 3) A cantilever beam has a Z section of uniform thickness for which $I_y = \frac{2}{3}th^3$, $I_z = \frac{8}{3}th^3$, and $I_{yz} = -th^3$. Determine the maximum bending stress in the beam subjected to a load P at its free end.

