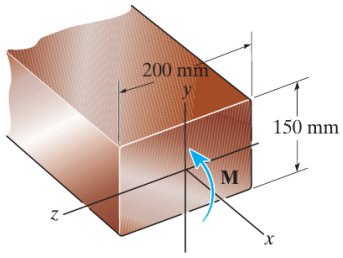
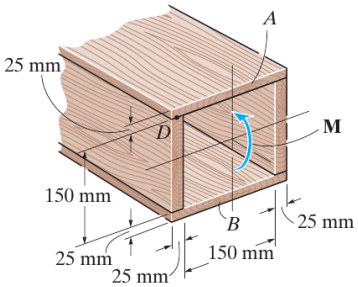
ENG104: Mechanics of Materials

ENG104, HW # 4, Due Tuesday 13May2025 by midnight, on canvas

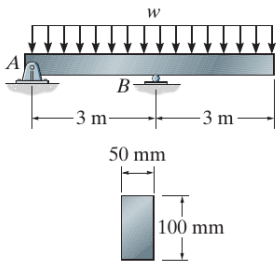
1. A member having the dimensions shown is used to resist an internal bending moment of $M = 90\,\text{kN}\cdot\text{m}$. Determine the maximum stress in the member if the moment is applied (a) about the z axis (as shown), (b) about the y axis. Sketch the stress distribution for each case.



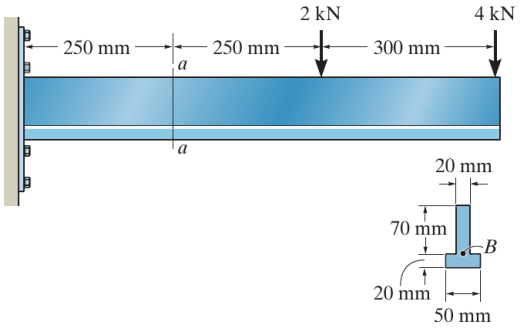
2. Determine the moment M that should be applied to the beam in order to create a compressive stress at point D of $\sigma_D = 30$ MPa. Also sketch the stress distribution acting over the cross section and calculate the maximum stress in the beam.



3. The overhang beam is subjected to the uniform distributed load having an intensity of $w = 50$ kN/m. Determine the maximum shear stress in the beam.



4. Determine the maximum shear stress acting at section a–a of the cantiliver strut.



SOLUTION