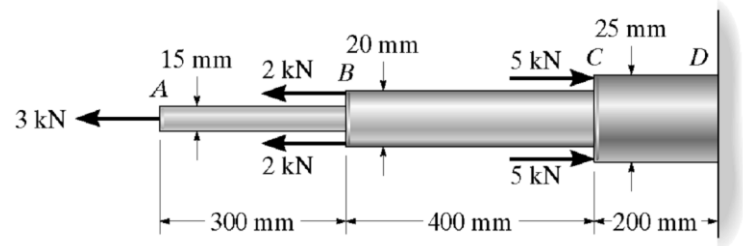


Name:

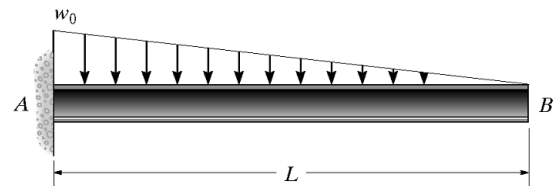
Student ID:

AM32: Elastic Strain Energy

1. Determine the strain energy in the rod assembly. Portion AB is steel, BC is brass, and CD is aluminum. $E_{st} = 200$ GPa, $E_{br} = 101$ GPa, and $E_{al} = 73.1$ GPa.



2. Determine the bending strain energy in the beam due to the distributed load. EI is constant.

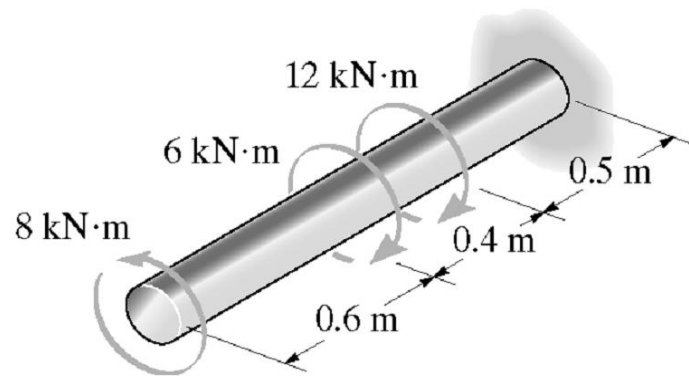


Name:

Student ID:

AM32: Elastic Strain Energy

3. Determine the torsional strain energy in the steel shaft. The shaft has a radius of 40 mm. $G_{st} = 75$ GPa.



4. The strain-energy density must be the same whether the state of stress is represented by σ_x , σ_y , and τ_{xy} , or by the principal stresses σ_1 and σ_2 . This being the case, equate the strain-energy expressions for each of these two cases and show that $G = E/[2(1+\nu)]$.