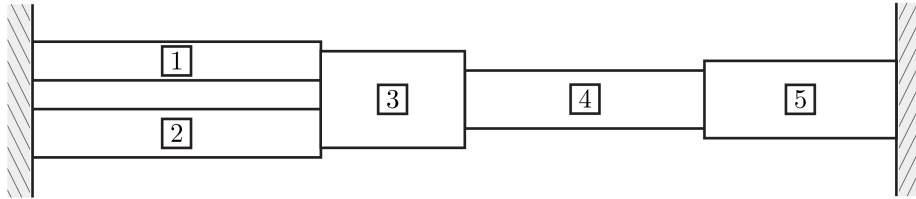


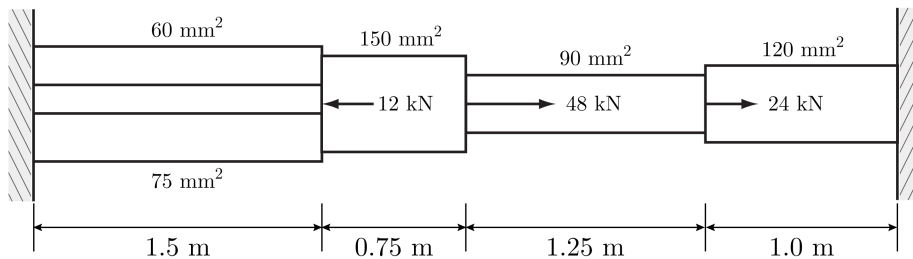
CE 325 Spring 2026 HW#4

Due Thursday, February 19, at the beginning of class

1. Analyze the uniaxial structure shown below using the Matrix Displacement Method:



- a. (2.5 pts) Use the notation outlined in class to label all: joints, degrees of freedom, loads, and reactions.
- b. (5 pts) Use the definition of structural level stiffness (S_{ij}) and superposition to develop the structural force-displacement relationship: $\{P\} = [S]\{d\}$.
- c. (5 pts) Use the definition of member level stiffness (k_{ij}) and superposition to develop the member force-displacement relationship: $\{Q\} = [k]\{u\}$.
- d. (5 pts) Use the Rigorous Method to assemble $[S]$ in terms of the k_{ij} 's for each member.
- e. (2.5 pts) Use the Code Number Method to assemble $[S]$ in terms of the k_{ij} 's for each member.
- f. (5 pts) Given the applied loads, member geometry, and material properties below: determine displacements, member forces (indicate tension or compression), and support reactions.



$E = 20 \text{ GPa}$ for all members