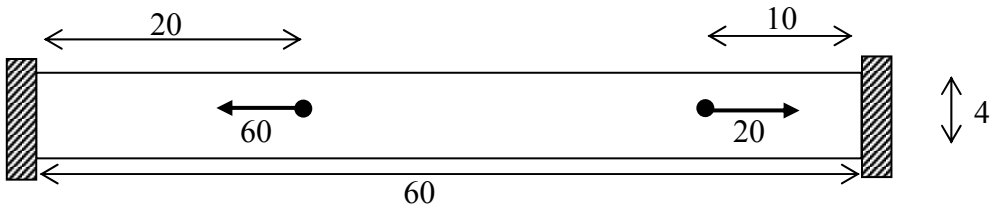
Comparison of FEA and Predictions For Bar with Multiple Axials Loads

Geometry: Length = 60, Height = 4
Material: E =1000, $\nu = 0.3$.
Mesh: 60 x 4 Linear Elements.
Loads:
Left end: $U_x = 0$ and $U_y = 0$.
Right end: $U_x = 0$ and $U_y = 0$.
Fx = -15 at (x,y) = (20,1), (20,2), (20,3) and Fx = -7.5 on (20,0), (20,4); Fy = 0 on all.
Fx = 5 at (x,y) = (50,1), (50,2), (50,3) and Fx = 2.5 on (50,0), (50,4); Fy = 0 on all.
(These nodal forces produce a net force of -60 and 20 at x = 20 and x = 50.)



FEA Results to Extract
- σ_x and Ux at (x,y) = (35,2)

Analyses to Compare with FEA Results
- Enter FEA stress σ_x and FEA displacement Ux at (x,y) = (35,2) into table.
- Solve axial loading problem, and predict stress and displacement at the point (x,y) = (35,2). Enter values into tables.

Numerical Results

Stress and displacements at (x,y) = (35,2); Compare FEA results and predictions based on solving this problem by methods of axial loading			
σ_x (FEA)	σ_x (Axial loading)	Ux (FEA)	Ux (Axial loading)

Give your analysis of the problem using the methods of axial loading on a separate page that you attach. Show precisely how you find σ_x and Ux at (x,y) = (35,2).