Birzeit University
Faculty of Engineering
Department of Civil and Environmental Engineering

ENCE 3331, Structural Analysis I

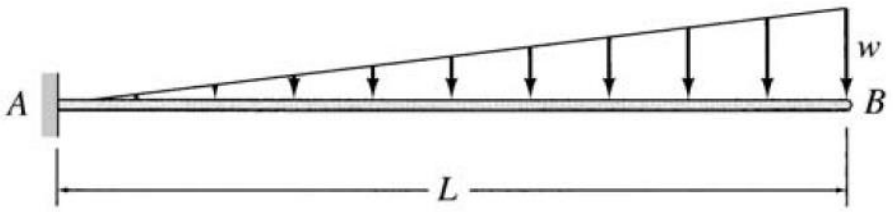
Homework assignment #4

Due on Tuesday, April 2nd , 2020 @ 8:30 AM.

Question 1: Using Double integration method, Answer the following questions

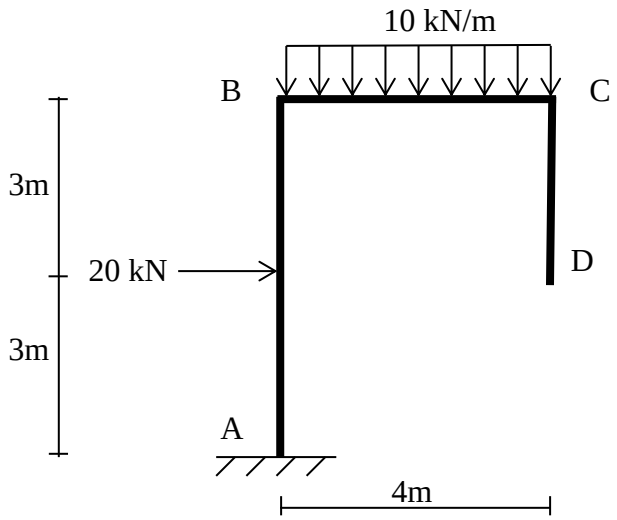
For the following beam: Determine

- Maximum deflection of the beam in terms of w, L, E, and I.
- The rotation of point B, if w=10 kN/m, L= 5 m, E= 75 GPa, and I = $4x10^8$ mm^4.
- The minimum moment of inertia (I) so that the maximum deflection in the beam doesn't exceed ($\Delta_{max} = \frac{L}{360}$), if w= 20 kN/m, L= 6 m, E= 200 GPa.



For the given frame Determine:

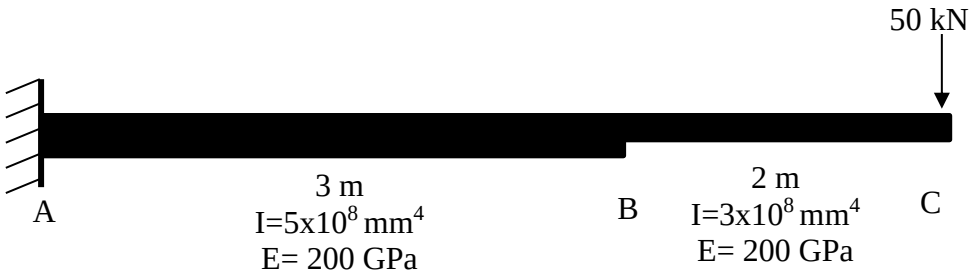
- The maximum horizontal displacement (sway) of the frame
- The vertical deflection of point D.



Question 2: Using <u>Moment area method</u>, answer the following questions

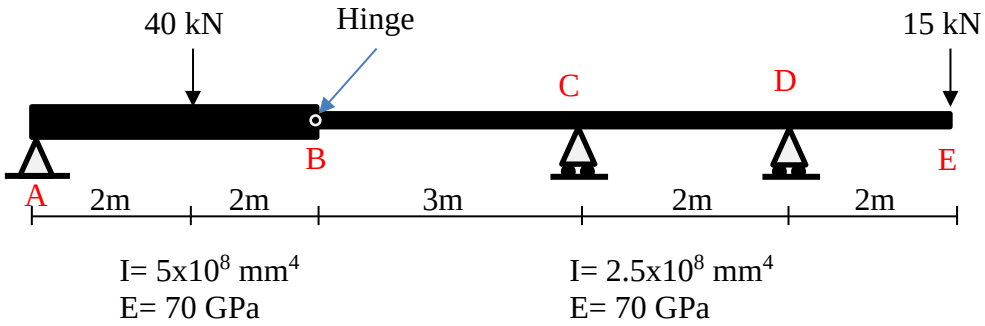
For the following beam, Determine:

- Deflection at point C.
- Deflection at point B.
- Rotation of point B.



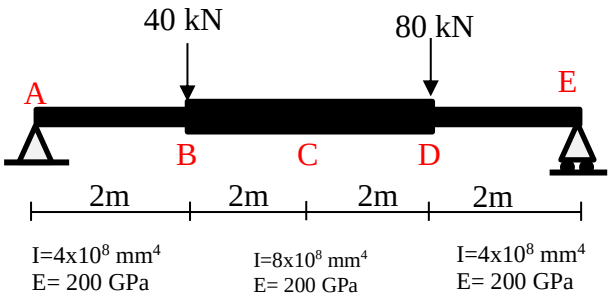
For the following beam, determine:

- Deflection of Points B, and E.
- Rotation of points A, C, D, and E.



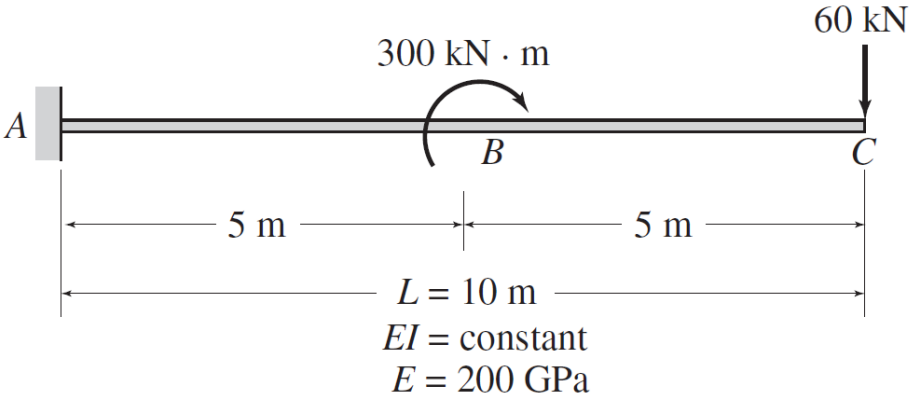
For the given beam, determine:

- Deflection of points B, and D.
- Rotation of points A, C, and E.



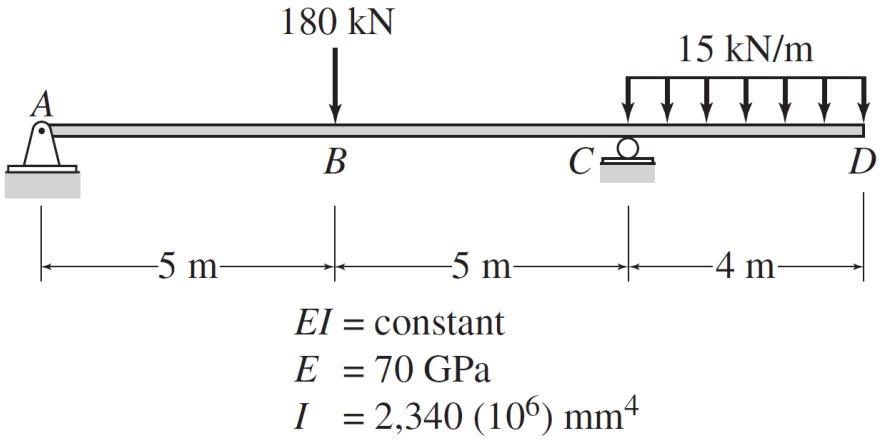
Question 3: Using <u>conjugate beam method</u>, answer the following questions

For the given beam, determine the minimum required moment of inertia so that the maximum deflection in the beam doesn't exceed $\Delta_{max} = \frac{L}{240}$.



For the given beam, determine:

- Deflection of points B, and D.
- Rotation of points A, and C.



For the given beam, determine:

- Deflection of point B.
- Rotation of points A, and C.