

## Internal Reactions/Trusses & Frames

**Q1.** For the cantilever beam and loading shown in Figure 1 (Given that  $w_a = 3 \text{ kN/m}$ ,  $w_b = 5 \text{ kN/m}$ ,  $a = 4\text{m}$ ,  $b = 3\text{m}$ )

- Derive equations for the shear force  $V$  and the bending moment  $M$  for any location in the beam. (Place the origin at point A.)
- Plot the shear-force and bending-moment diagrams for the beam using the derived functions.

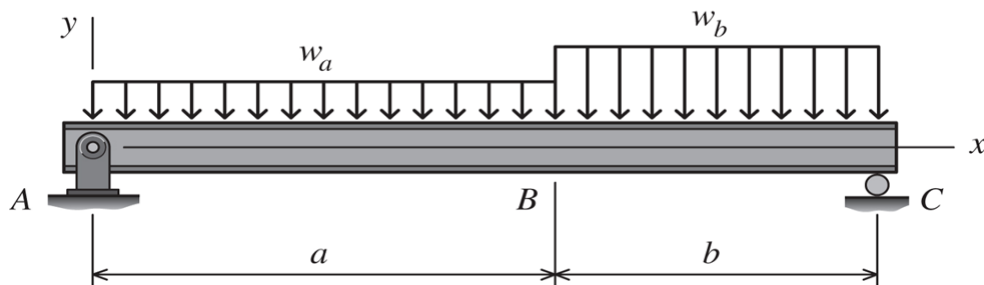


Figure 1

**Q2.** For the simply supported beam subjected to the loading shown in Figure 2,

- Derive equations for the shear force  $V$  and the bending moment  $M$  for any location in the beam. (Place the origin at point A.)
- Plot the shear-force and bending-moment diagrams for the beam using the derived functions.
- Report the maximum positive bending moment, the maximum negative bending moment, and their respective locations.

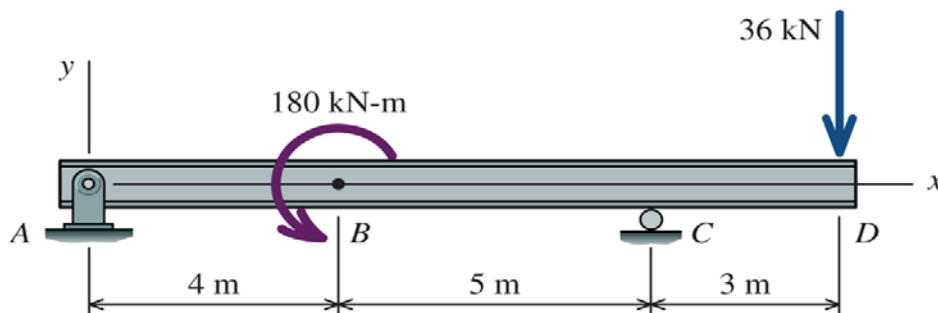
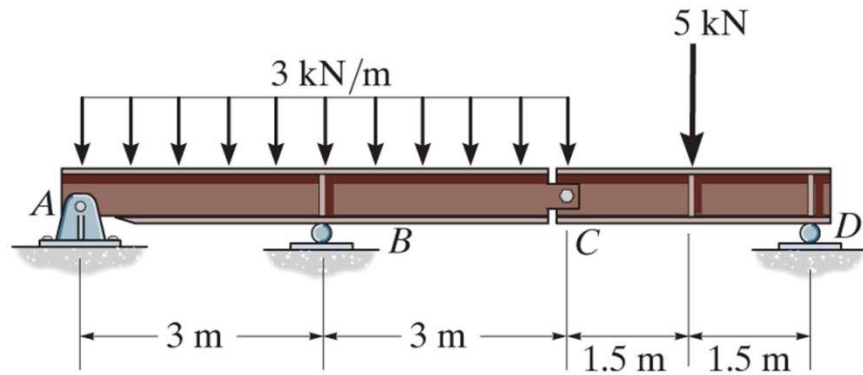


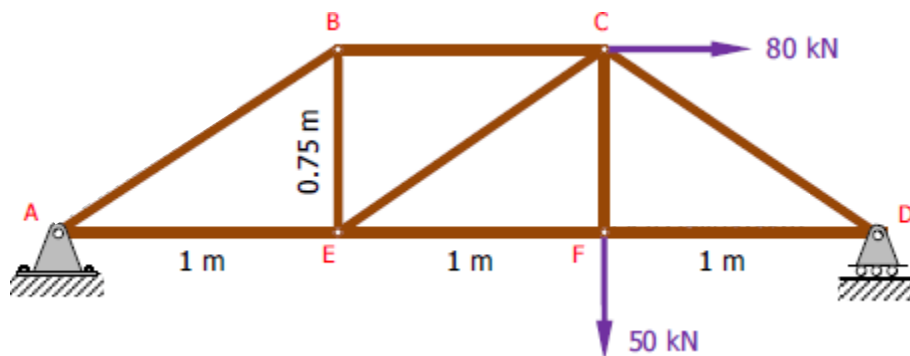
Figure 2

**Q3.** Draw the shear force and bending moment diagrams for the compound beam illustrated in Figure 3. (C is an internal hinge)



**Figure 3**

**Q4.** Find the force acting in all members of the truss shown in Figure 4 using method of joints.



**Figure 4**