4-16. Determine the internal normal force, shear force, and moment at points E and D of the compound beam.

Segment EC:
\[ -\Sigma F_y = 0; \quad N_E = 0 \quad \text{Ans} \]
\[ +\Sigma F_y = 0; \quad V_D + 50 = 0 \]
\[ V_D = -50 \text{ N} \quad \text{Ans} \]
\[ +\Sigma M_y = 0; \quad -200 + 50(2) - M_E = 0 \]
\[ M_E = -100 \text{ N} \cdot \text{m} \quad \text{Ans} \]

Segment DB:
\[ -\Sigma F_y = 0; \quad N_D = 0 \quad \text{Ans} \]
\[ +\Sigma F_y = 0; \quad V_D - 800 + 50 = 0 \]
\[ V_D = 750 \text{ N} \quad \text{Ans} \]
\[ +\Sigma M_y = 0; \quad 800(2) + 5(50) - M_D = 0 \]
\[ M_D = -1300 \text{ N} \cdot \text{m} = -1.30 \text{ kN} \cdot \text{m} \quad \text{Ans} \]

4-28. Draw the shear and moment diagrams for the wood beam, and determine the shear and moment throughout the beam as functions of x.

Support Reactions: As shown on FBD.
Shear and Moment Functions:
For 0 ≤ x < 4 ft:
\[ +\Sigma F_y = 0; \quad -250 - V = 0 \quad V = -250 \text{ lb} \quad \text{Ans} \]
\[ +\Sigma M_x = 0; \quad M + 250x = 0 \quad M = [-250x] \text{ lb-ft} \quad \text{Ans} \]

For 4 ft ≤ x < 10 ft:
\[ +\Sigma F_y = 0; \quad -250 + 700 - 150(x-4) - V = 0 \]
\[ V = (1050 - 150x) \text{ lb} \quad \text{Ans} \]
\[ +\Sigma M_x = 0; \quad M + 150(x-4) \left(\frac{x-4}{2}\right) + 250x - 700(x-4) = 0 \]
\[ M = [-15x^2 + 1050x - 4000] \text{ lb-ft} \quad \text{Ans} \]

For 10 ft ≤ x ≤ 14 ft:
\[ +\Sigma F_y = 0; \quad V - 250 = 0 \quad V = 250 \text{ lb} \quad \text{Ans} \]
\[ +\Sigma M_x = 0; \quad M - 250(14-x) = 0 \quad M = (2100 - 3500x) \text{ lb-ft} \quad \text{Ans} \]

4-29. Draw the shear and moment diagrams for the beam, and determine the shear and moment throughout the beam as functions of x.