

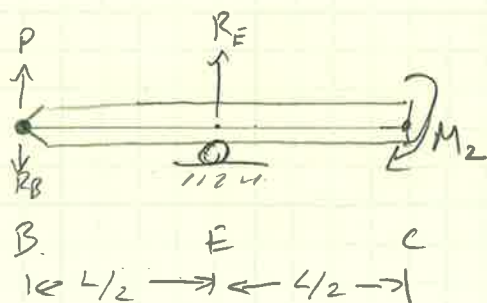
$$L = 4 \text{ m}$$

$$P = 5 \text{ kN}$$

$$M_1 = 50 \text{ kNm}$$

$$M_2 = 5 \text{ kNm}$$

Analyze BEC first:



Sum Forces:

Sum Moments About C:

$$P + R_E = R_B$$

$$M_2 + P \cdot L + R_E \cdot \frac{L}{2} = R_B \cdot L$$

$$5 \text{ kN} + R_E = R_B$$

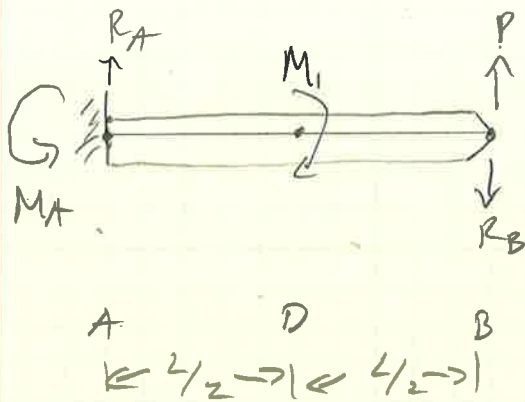
$$5 \text{ kNm} + (5 \text{ kN} \cdot 4 \text{ m}) + R_E \cdot 2 \text{ m} = R_B \cdot 4 \text{ m}$$

$$25 \text{ kNm} + R_E \cdot 2 \text{ m} = R_B \cdot 4 \text{ m}$$

$$R_B = 7.5 \text{ kN}$$

$$R_E = 2.5 \text{ kN}$$

Analyze ADB Second:



Sum Forces:

$$R_A + P = R_B$$

$$R_A + 5 \text{ kN} = 7.5 \text{ kN}$$

$$\boxed{R_A = 2.5 \text{ kN}}$$

Sum Moments about A:

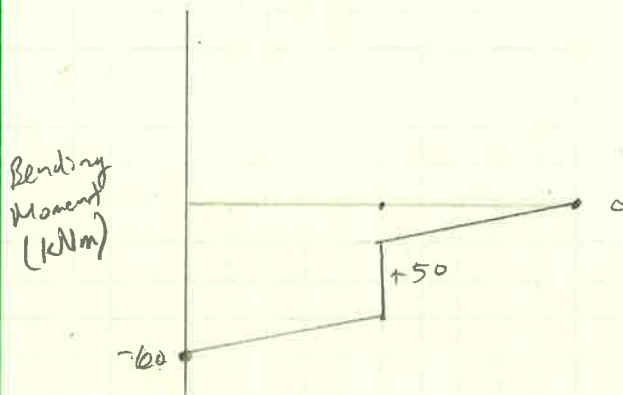
$$M_A + P \cdot L = M_1 + R_B \cdot L$$

$$M_A + 5 \text{ kN} \cdot 4 \text{ m} = 50 \text{ kNm} + 7.5 \text{ kN} \cdot 4 \text{ m}$$

$$M_A + 20 \text{ kNm} = 80 \text{ kNm}$$

$$\boxed{M_A = 60 \text{ kNm}}$$

Bending Moment Diagram:



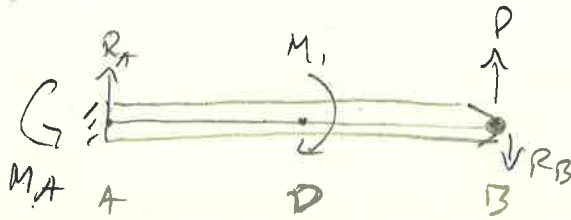
Sum moments about B:

$$M_1 + R_A \cdot L = M_A$$

$$50 + 2.5 \text{ kN} \cdot 4 \text{ m} = M_A$$

$$\boxed{M_A = 60 \text{ kNm}}$$

Working forward from answer (doesn't work):



Sum Forces:

$$R_A + P = R_B$$

$$R_A = R_B - P$$

$$R_A = 1.25 \text{ kN} - 5 \text{ kN}$$

$$\boxed{R_A = -3.75 \text{ kN}}$$

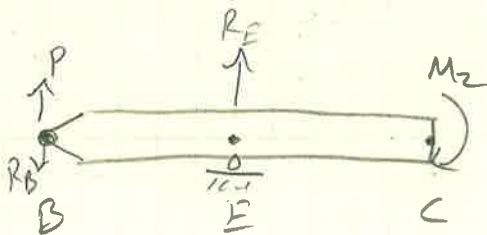
Sum Moments about A:

$$M_A + P \cdot L = M_1 + R_B \cdot L$$

$$35 \text{ kNm} + 5 \text{ kN} \cdot 4 \text{ m} = 50 \text{ kNm} + R_B \cdot 4 \text{ m}$$

$$55 \text{ kNm} = 50 \text{ kNm} + R_B \cdot 4 \text{ m}$$

$$\boxed{R_B = 1.25 \text{ kN}}$$



Sum Forces:

$$P + R_E = R_B$$

$$5 \text{ kN} + R_E = 1.25 \text{ kN}$$

$$R_E = -3.75 \text{ kN} \quad (\text{not in compression?})$$

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Sum Moments About C:

$$M_2 + R_E \cdot \frac{L}{2} + P \cdot L = R_B \cdot L$$

$$5 \text{ kNm} + (-3.75) \cdot 2 \text{ m} + 5 \text{ kN} \cdot 4 \text{ m} = R_B \cdot 4 \text{ m}$$

$$17.5 \text{ kNm} = R_B \cdot 4 \text{ m}$$

$$R_B = 4.375 \quad (\text{not balanced})$$

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