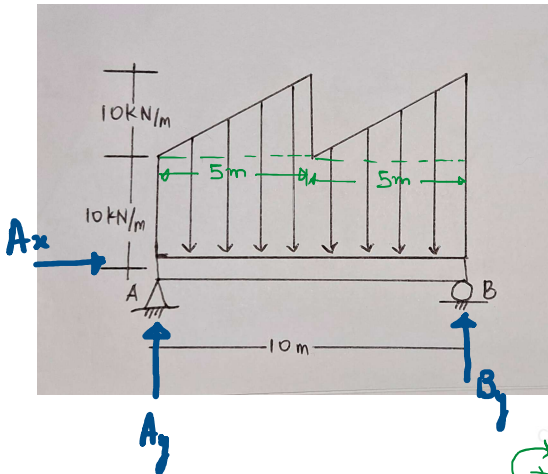


Support reactions in beams carrying Uniformly varying load and uniformly distributed load:

Find the support reactions in the following beam:



Total Applied load

$$= (10 \text{ kN/m} \times 10 \text{ m}) + \frac{1}{2} (5 \text{ m} \times 10 \text{ kN/m}) + \frac{1}{2} (5 \text{ m} \times 10 \text{ kN/m})$$

$$= 100 \text{ kN} + 25 \text{ kN} + 25 \text{ kN} = 150 \text{ kN}$$

$$\sum M_B = 0:$$

$$(A_y \times 10 \text{ m}) - (10 \text{ kN/m} \times 10 \text{ m} \times \frac{10 \text{ m}}{2}) - \frac{1}{2} (5 \text{ m} \times 10 \text{ kN/m}) \times (\frac{5 \text{ m}}{3} + 5 \text{ m}) - \frac{1}{2} (5 \text{ m} \times 10 \text{ kN/m}) \times (\frac{5 \text{ m}}{3}) = 0$$

$$\Rightarrow A_y = \frac{425}{6} \text{ kN} \approx 70.83 \text{ kN}$$

$$\sum F_y = 0:$$

$$\Rightarrow A_y + B_y - 150 \text{ kN} = 0 \quad \text{--- (1)}$$

$$\text{Put } A_y = \frac{425}{6} \text{ kN} \rightarrow \text{--- (1):}$$

$$\Rightarrow B_y = \frac{475}{6} \text{ kN} \approx 79.16 \text{ kN}$$

$$\sum F_x = 0:$$

$$A_x = 0$$

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