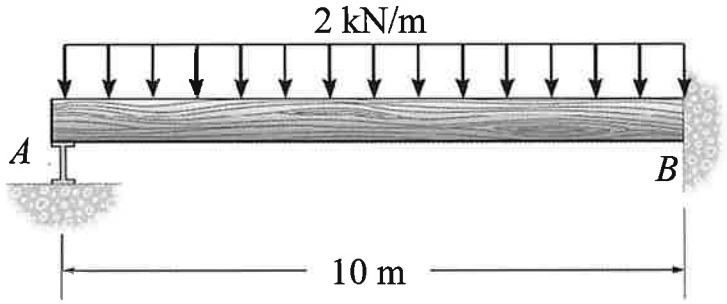
Problem 9a-2 – Compute the reactions and draw the shear and moment curves for the following beam.



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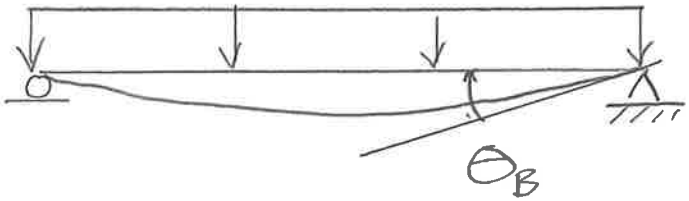

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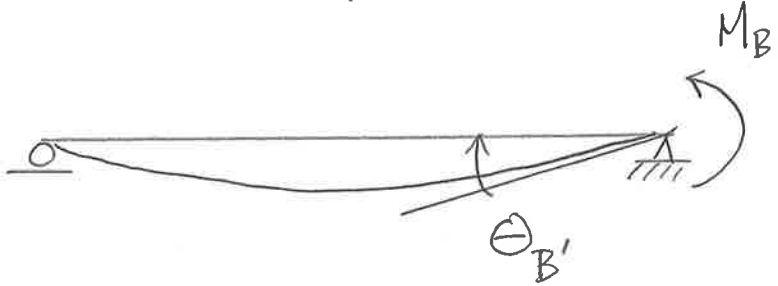


$$\theta_B + \theta_{B'} = 0$$

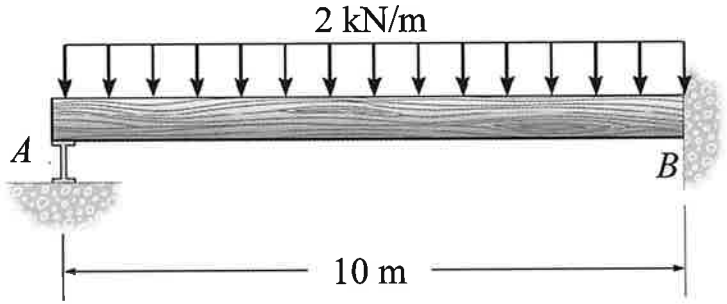
$$\theta_B = \frac{WL^3}{24EI} = \frac{(2\text{kN/m})(10\text{m})^3}{24EI} = \frac{250\text{kNm}^2}{3EI}$$

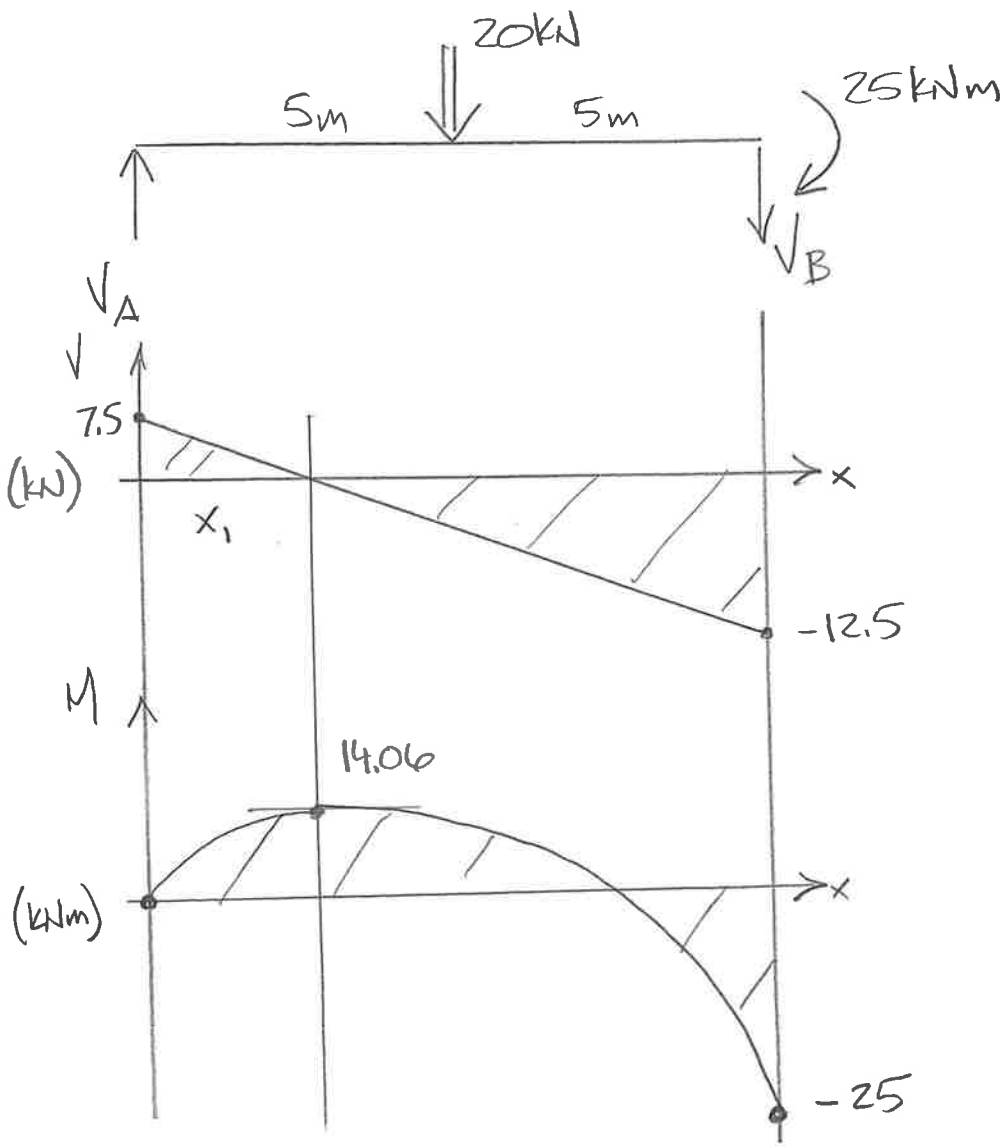
$$\theta_{B'} = \frac{M_B L}{3EI} = M_B \frac{10\text{m}}{3EI}$$

$$-\frac{250\text{kNm}^2}{3EI} = M_B \frac{10\text{m}}{3EI}$$

$$M_B = -25\text{ kNm}$$

Problem 9a-2 – Compute the reactions and draw the shear and moment curves for the following beam.





$$\circlearrowleft + \Sigma M_A = 0 = -20kN(5m) - 25kNm - V_B(10m)$$

$$\underline{\underline{V_B = -12.5kN}}$$

$$+\uparrow \Sigma F_y = 0 = V_A - V_B - 20kN$$

$$\underline{\underline{V_A = 7.5kN}}$$

$$\Delta V = \int w\,dx \qquad \frac{dV}{dx} = w$$

$$\Delta M = \int V\,dx \qquad \frac{dM}{dx} = V$$

$$x_1 = \frac{7.5kN}{2kN/m} = 3.75m$$