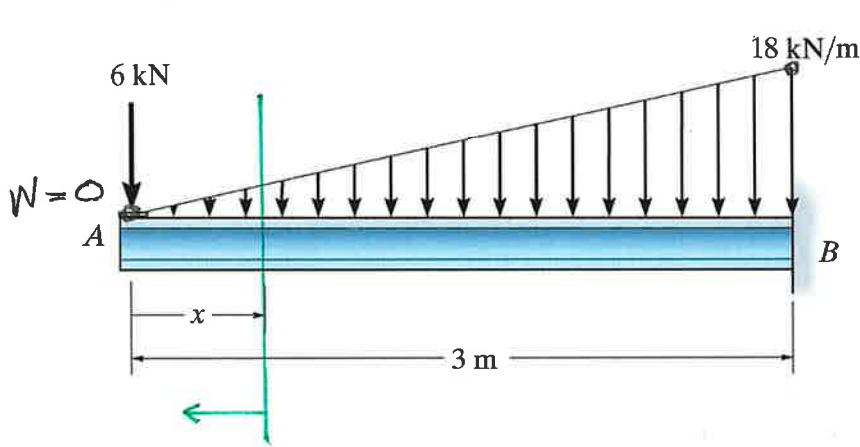


Example 4b-1 - Determine the internal shear and bending moment as a function of  $x$ .

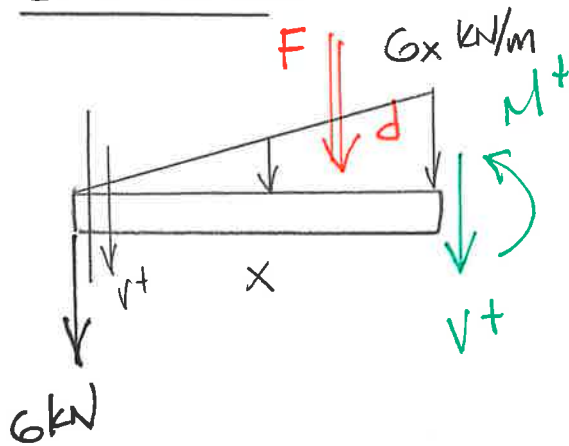


$$W(x) = A + Bx$$

$$B = \text{SLOPE} = \frac{18 \text{ kN/m}}{3 \text{ m}} = 6 \text{ kN/m}^2$$

$$W(x) = [6x] \text{ kN/m}$$

$$0 \leq x \leq 3 \text{ m}$$



$$d = \frac{x}{3}$$

$$F = \frac{1}{2}(x)6x = 3x^2$$

$$\sum M_{\text{cut}} = 0 = M + Fd + 6 \text{ kN}(x)$$

$$= M + 3x^2\left(\frac{x}{3}\right) + 6 \text{ kN}(x)$$

$$M = [-x^3 - 6x] \text{ kNm}$$

$$M(x=0) = 0$$

$$M(x=3) = -45 \text{ kNm}$$

$$\sum F_y = 0 = -V - 3x^2 - 6 \text{ kN}$$

$$V = [-3x^2 - 6] \text{ kN}$$

$$\frac{dM}{dx} = V$$