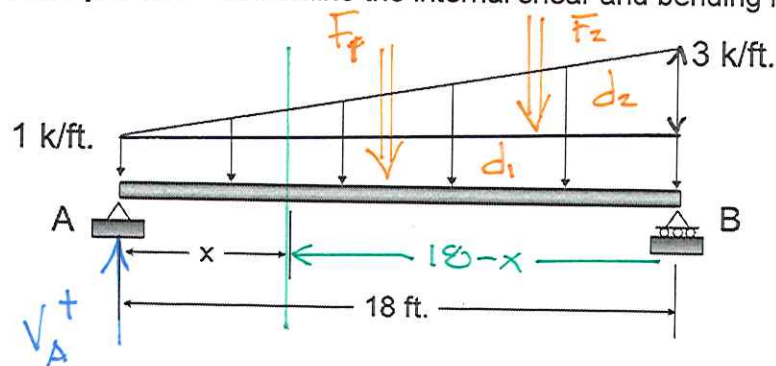


Example 4b-3 - Determine the internal shear and bending moment as a function of x .

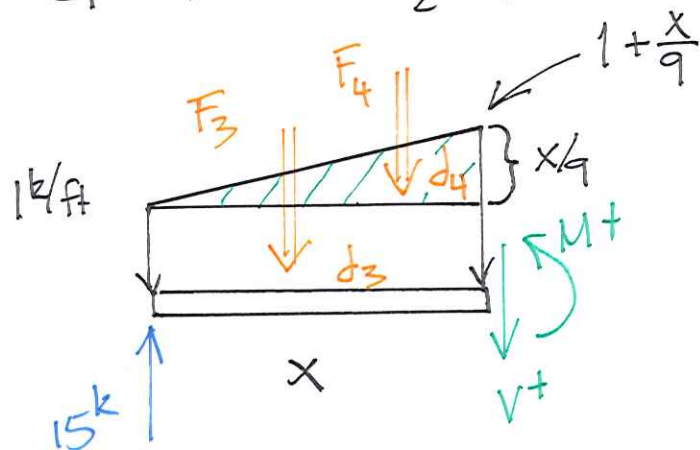


$$\sum M_B = 0 = 18^k(9') + 18^k(6') - V_A(18')$$

$$\underline{V_A = 15^k}$$

$$F_1 = 18^k \quad F_2 = \frac{1}{2}(18') \cdot 2^k/\text{ft} = 18^k$$

$$d_1 = 9' \quad d_2 = 6'$$



$$\sum M_{cut} = 0 = M + x \left(\frac{x}{2} \right) + \frac{x^2}{18} \left(\frac{x}{3} \right) - 15^k(x)$$

$$\underline{M(x) = \left[-\frac{x^3}{54} - \frac{x^2}{2} + 15x \right] \text{ kft}}$$

$$M(x=0) = 0 \quad M(x=18) = 0$$

$$\sum F_y = 0 = -V - x - \frac{x^2}{18} + 15^k$$

$$\underline{V(x) = \left[-\frac{x^2}{18} - x + 15 \right] \text{ k}}$$

$$V(x=0) = 15^k \quad V(x=18) = \underline{V_B}$$

$$F_3 = x \quad F_4 = \frac{1}{2}(x) \frac{x}{9} = \frac{x^2}{18}$$

$$d_3 = \frac{x}{2} \quad d_4 = \frac{x}{3}$$

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