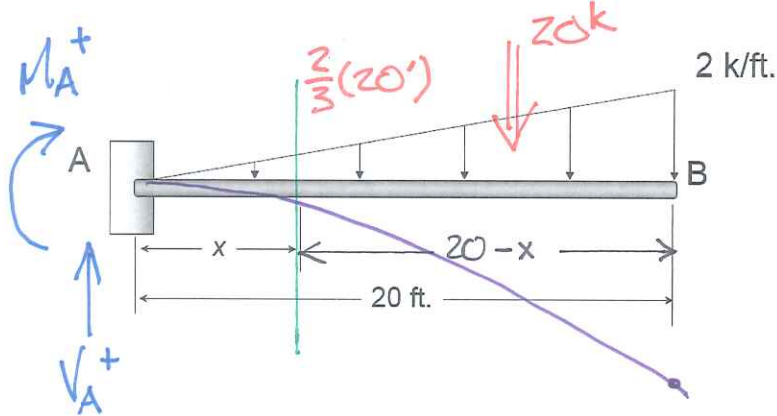


Example 4b-1 - Determine the internal shear and bending moment as a function of x .

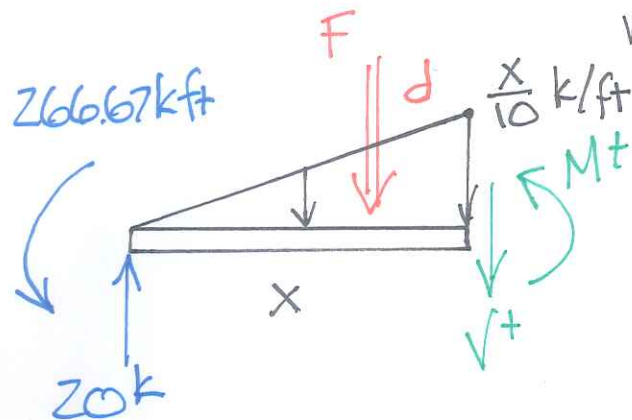


$$\sum M_A = 0 = -M_A - 20k \left(\frac{40}{3}' \right)$$

$$\underline{M_A = -266.67 \text{ kft}}$$

$$\sum F_y = 0 = V_A - 20k \quad \underline{V_A = 20k}$$

$$W = Ax + B \quad A = 2k/ft / 20ft = \frac{1}{10}$$



$$\sum M_{cut} = 0 = \left[M + \frac{x^2}{20} \left(\frac{x}{3} \right) - 20x + 266.67 \right] \text{ kft}$$

$$\underline{M(x) = \left[-\frac{x^3}{60} + 20x - 266.67 \right] \text{ kft}} \quad \begin{array}{l} M(x=0) = 0 \\ M(x=20) = 0 \end{array}$$

$$F = \frac{1}{2}(x) \frac{x}{10} = \frac{x^2}{20}$$

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

$$\sum F_y = 0 = \left[-V - \frac{x^2}{20} + 20 \right] k$$

$$\underline{V(x) = \left[-\frac{x^2}{20} + 20 \right] k}$$

$$\begin{array}{l} V(x=0) = 20k \\ V(x=20) = 0 \end{array}$$

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