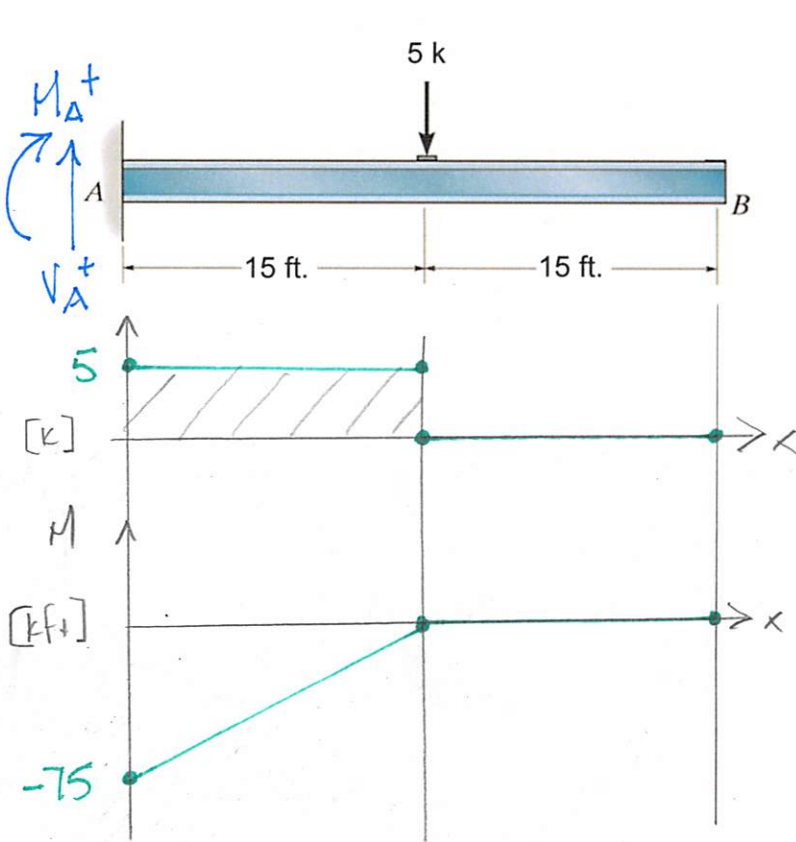


Example 7b-1: Determine the slope and the displacement at point B for the beam. Assume that $E = 30,000$ ksi and $I = 800$ in⁴.

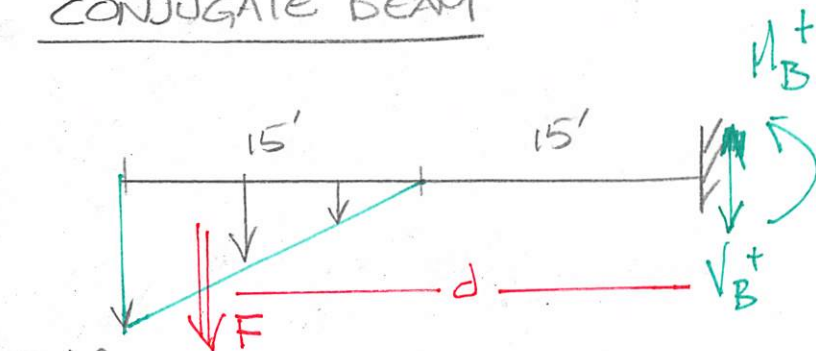


$$\begin{aligned} \sum M_A = 0 &= -M_A - 5k(15ft) & M_A &= -75kft \\ \sum F_y = 0 &= V_A - 5k & V_A &= 5k \end{aligned}$$

$$\begin{aligned} \sum M_B = 0 &= M_B + Fd & M_B &= -Fd \\ M_B &= -\frac{14,062.5kft^3}{EI} & \Rightarrow & \theta_B \end{aligned}$$

$$\begin{aligned} \theta_B &= \frac{-14,062.5kft^3}{30,000k \cdot 800in^4} \cdot \frac{1in^2}{1ft^2} \cdot \frac{1,728in^3}{1ft^3} \\ &= \underline{\underline{-1.013in}} \end{aligned}$$

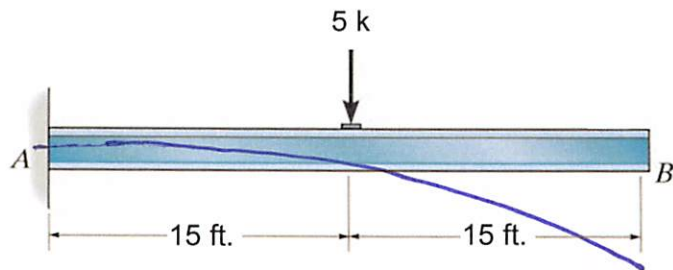
CONJUGATE BEAM



$$F = \frac{1}{2}(15ft) \frac{75kft}{EI} = \frac{562.5kft^2}{EI}$$

$$d = 15' + \frac{2}{3}(15') = 25ft$$

Example 7b-1: Determine the slope and the displacement at point B for the beam. Assume that $E = 30,000$ ksi and $I = 800$ in⁴.



$$\uparrow \sum F_y = 0 = -V_B - F \quad V_B = -F$$

$$V_B = \frac{-562.5 \text{ k ft}^2}{EI} \Rightarrow \theta_B$$

$$= \frac{-562.5 \cancel{\text{ k}} \text{ ft}^2}{30,000 \cancel{\text{ k}} \text{ in}^2 \cdot 800 \text{ in}^4 \cdot \left(\frac{12 \text{ in}}{1 \cancel{\text{ ft}}} \right)^2}$$

$$= \underline{\underline{-0.0034 \text{ RADIANS}}}$$