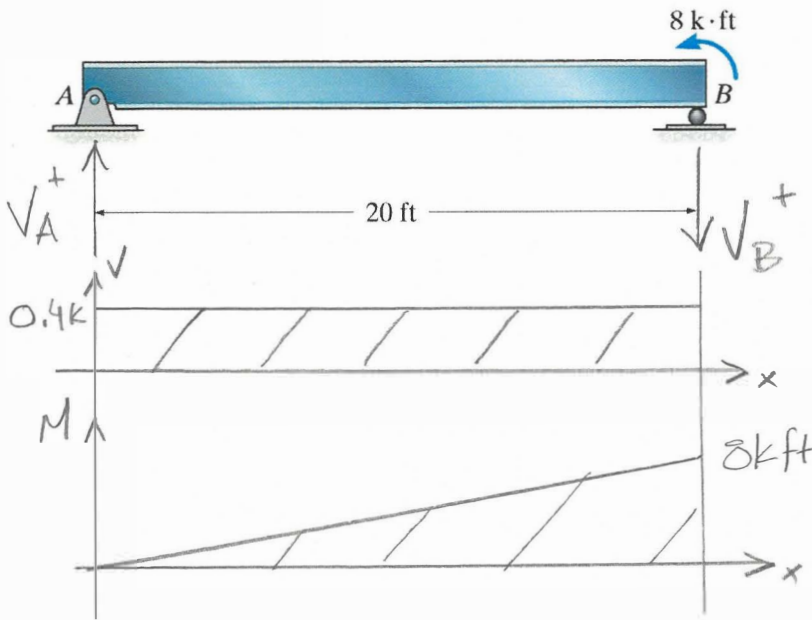


Use the conjugate beam method to determine the mid-span displacement and slope ^(AT A) for the beam shown below. EI is constant.



$$\sum M_B = 0 = 8kft - V_A(20')$$

$$\underline{V_A = 0.4k}$$

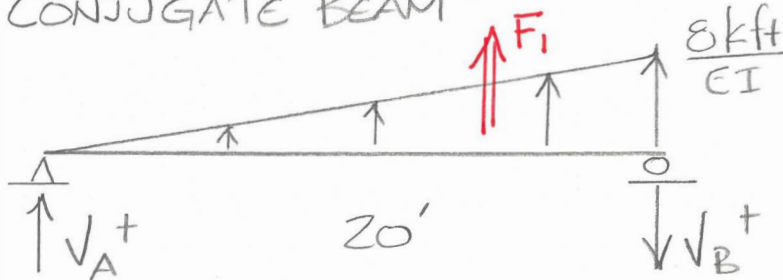
$$\sum F_y = 0 = V_A - V_B$$

$$\underline{V_B = 0.4k}$$

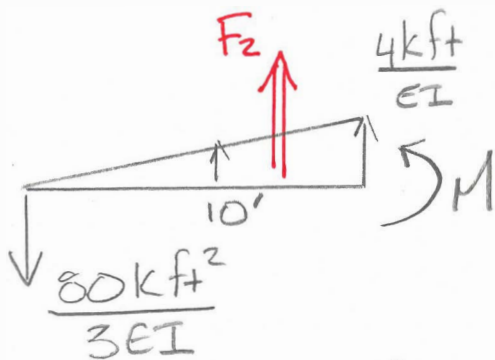
$$\sum M_B = 0 = -\bar{F}_1\left(\frac{20'}{3}\right) - V_A(20')$$

$$\underline{\underline{V_A = -\frac{80kft^2}{3EI}}}$$

CONJUGATE BEAM



$$F_1 = \frac{1}{2}(20') \frac{8kft}{EI} = \frac{80kft^2}{EI}$$



$$F_2 = \frac{1}{2}(10') \frac{4kft}{EI} = \frac{20kft^2}{EI}$$

$$\sum M = 0 = M - F_2\left(\frac{10'}{3}\right) + \frac{80kft^2}{3EI}(10')$$

$$\underline{\underline{M = -\frac{200kft^3}{EI}}}$$