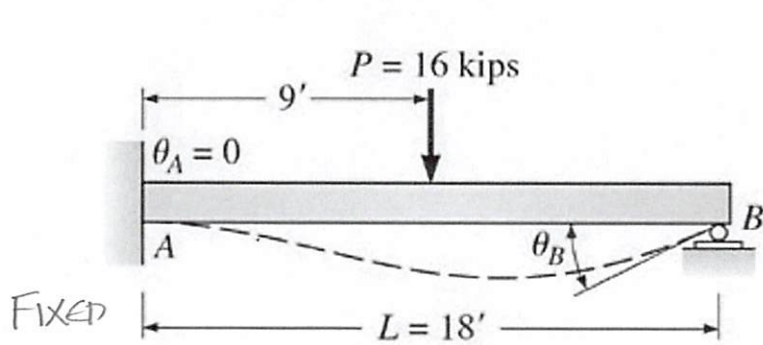


Problem 10a-1 – Determine the moment at A. Assume the support at A is fixed, and B is a roller. EI is constant.



$$\text{FEM } \frac{PL}{8} \quad \left(\begin{array}{c} \downarrow P \\ \hline L/2 \quad L/2 \end{array} \right) \quad \frac{PL}{8}$$

$$\frac{PL}{8} = \frac{16^k(18')}{8} = \pm 36 \text{ kft}$$

$$M_{AB} = \frac{2EI}{L_{AB}} \left[2\theta_A + \theta_B + 3\psi \right] - 36 \text{ kft} \quad (1)$$

$$M_{BA} = \frac{2EI}{L_{AB}} \left[2\theta_B + \theta_A + 3\psi \right] + 36 \text{ kft} \quad (2)$$

$$M_{BA} = 0 \quad (3)$$

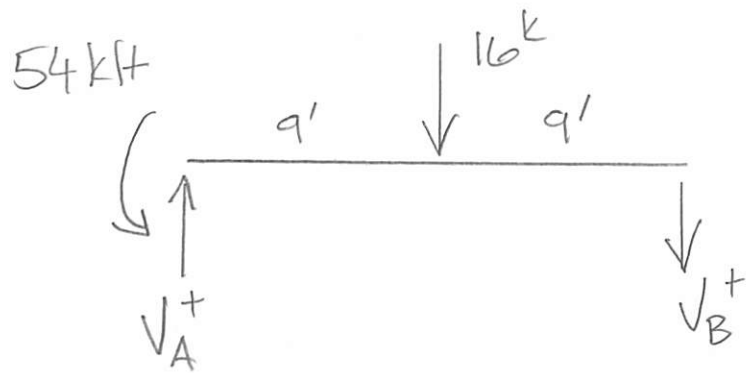
$$M_{BA} = 0 = \frac{2EI}{18'} \left[2\theta_B \right] + 36 \text{ kft} \Rightarrow \frac{4EI}{18} \theta_B = -36 \text{ kft}$$

$$\theta_B = - \frac{162 \text{ kft}^2}{EI}$$

$$EI = \left[\frac{F}{L^2} \right] L^4 = FL^2$$

Problem 10a-1 – Determine the moment at A. Assume the support at A is fixed, and B is a roller. EI is constant.

$$M_{AB} = \frac{2EI}{18'} [\theta_B] - 36 \text{ kft} = \frac{2EI}{18'} \left[-\frac{16(2 \text{ kft})^2}{EI} \right] - 36 \text{ kft} = \underline{\underline{-54 \text{ kft}}}$$



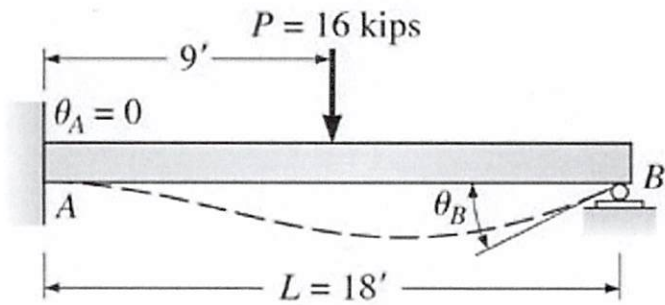
$$\sum M_A = 0 = 54 \text{ kft} - 16 \text{ k}(9') - V_B(18')$$

$$\underline{\underline{V_B = -5 \text{ k}}}$$

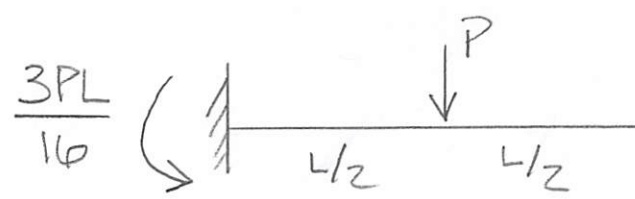
$$\sum F_y = 0 = V_A - V_B - 16 \text{ k}$$

$$\underline{\underline{V_A = 11 \text{ k}}}$$

Problem 10a-1 – Determine the moment at A. Assume the support at A is fixed, and B is a roller. EI is constant. (ALTERNATE SOLUTION)



* FEM - PINNED END



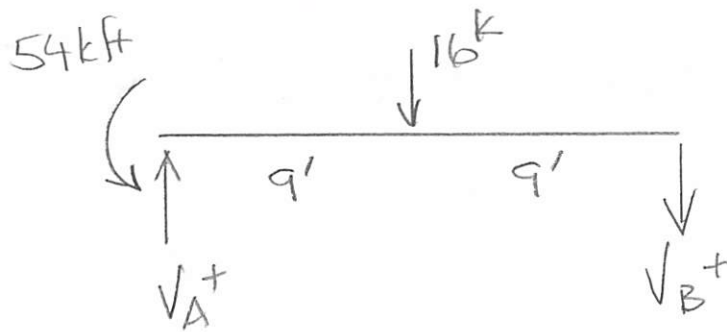
$$\frac{3PL}{16} \quad \frac{3PL}{16}$$

$$= \frac{3(16k)(18ft)}{16}$$

$$= \underline{\underline{-54kft}}$$

SECTION AB - 1 EQN

$$M_{AB} = \frac{3EI}{L_{AB}} \left[\theta_A - \psi \right] - 54kft = \underline{\underline{-54kft}}$$



$$\sum M_A = 0 = 54kft - 16k(9ft) - V_B(18ft)$$

$$\underline{\underline{V_B = -5k}}$$

$$\sum F_y = 0 = V_A - V_B - 16k$$

$$\underline{\underline{V_B = -11k}}$$