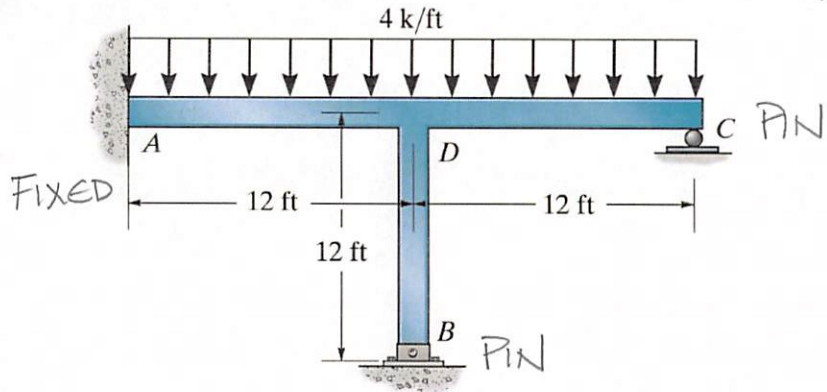


Problem 10b-5 – Determine the moments at the fixed support A and joint D. Assume B is pinned and EI is constant.



$$FEM_{AD} = \frac{WL^2}{12} = \frac{4 \text{ k/ft} (12 \text{ ft})^2}{12} = \pm 48 \text{ kft}$$

$$FEM_{DC} = -\frac{WL^2}{8} = -\frac{4 \text{ k/ft} (12 \text{ ft})^2}{8} = -72 \text{ kft}$$

SECTION AD – 2 EQNS

$$M_{AD} = \frac{2EI}{12 \text{ ft}} \left[2\theta_A + \theta_D - 3\psi \right] - 48 \text{ kft} \quad (1)$$

$$M_{DA} = \frac{2EI}{12 \text{ ft}} \left[2\theta_D + \theta_A - 3\psi \right] + 48 \text{ kft} \quad (2)$$

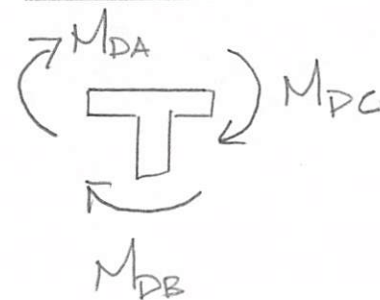
SECTION DC – 1 EQN

$$M_{DC} = \frac{3EI}{12 \text{ ft}} \left[\theta_D - \psi \right] - 72 \text{ kft} \quad (3)$$

SECTION DB – 1 EQN

$$M_{DB} = \frac{3EI}{12 \text{ ft}} \left[\theta_D - \psi \right] \quad (4)$$

JOINT D



$$\sum M_D = 0 = -M_{DA} - M_{DC} - M_{DB}$$

$$M_{DA} + M_{DC} + M_{DB} = 0 \quad (5)$$

Problem 10b-5 – Determine the moments at the fixed support A and joint D. Assume B is pinned and EI is constant.

$$\textcircled{5} \quad M_{DA} + M_{DC} + M_{DB} = 0$$

$$\left[\frac{2EI}{12ft} [2\theta_D] + 48kft \right] + \left[\frac{3EI}{12ft} [\theta_D] - 72kft \right] + \left[\frac{3EI}{12ft} [\theta_D] \right] = 0$$

$$\frac{5}{6} \theta_D = 24kft/EI \quad \theta_D = \frac{28.8kft^2}{EI}$$

$$M_{AD} = \frac{2EI}{12ft} [\theta_D] - 48kft = \underline{-43.2kft}$$

$$M_{DA} = \frac{2EI}{12ft} [2\theta_D] + 48kft = \underline{57.6kft}$$

$$M_{DC} = \frac{3EI}{12ft} [\theta_D] - 72kft = \underline{-64.8kft}$$

$$M_{DB} = \frac{3EI}{12ft} [\theta_D] = \underline{7.2kft}$$

$$M_{DA} + M_{DC} + M_{DB} = 0 \quad \checkmark$$