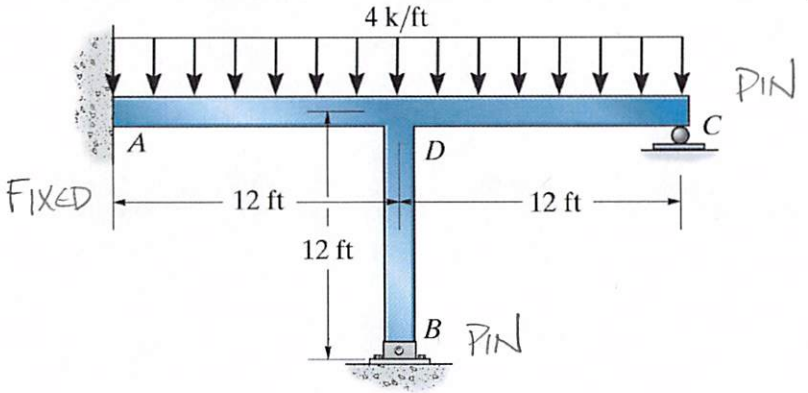
Problem 10b-5 – Determine the moments at the fixed support *A* and joint *D*. Assume *B* is pinned and *EI* is constant.



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

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

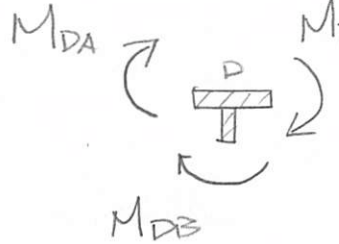
$$M_{AD} = \frac{2EI}{12'}\left[\theta_D\right] - 48kft \quad (1)$$

$$M_{DA} = \frac{2EI}{12'}\left[2\theta_D\right] + 48kft \quad (2)$$

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

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

JOINT D



$$\circlearrowleft + \sum M_D = 0$$

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

$$(5)\ M_{DA} + M_{DB} + M_{DC} = 0 = \underbrace{\frac{2EI}{12'}\left[2\theta_D\right] + 48kft}_{M_{DA}} + \underbrace{\frac{3EI}{12'}\left[\theta_D\right]}_{M_{DB}} + \underbrace{\frac{3EI}{12'}\left[\theta_D\right] - 72kft}_{M_{DC}}$$

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

$$\theta_D = \frac{144kft^2}{5EI}$$

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

$$M_{AD} = \frac{2EI}{12'}[\theta_D] - 48\,k\text{-}ft = \underline{-43.2\,k\text{-}ft}$$

$$M_{DA} = \frac{2EI}{12'}[2\theta_D] + 48\,k\text{-}ft = \underline{57.6\,k\text{-}ft}$$

$$M_{DC} = \frac{3EI}{12'}[\theta_D] - 72\,k\text{-}ft = \underline{-64.8\,k\text{-}ft}$$

$$M_{DB} = \frac{3EI}{12'}[\theta_D] = \underline{7.2\,k\text{-}ft}$$

$M_{DA} + M_{DC} + M_{DB} = 0$ ✓