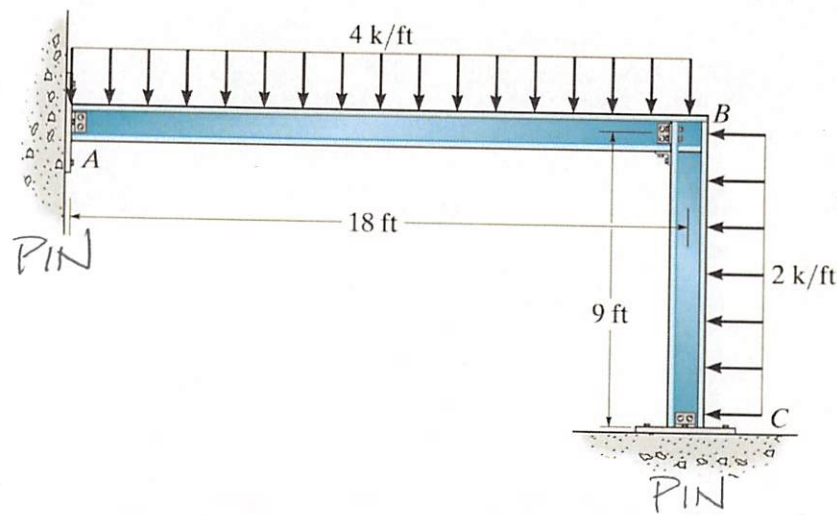


Problem 10b-2 – Determine the reactions at the supports. Assume A and C are pins, B is fixed, and EI is constant.



$$FEM_{BA} = \frac{WL^2}{8} = \frac{4 \text{ k/ft} (18 \text{ ft})^2}{8} = 162 \text{ kft}$$

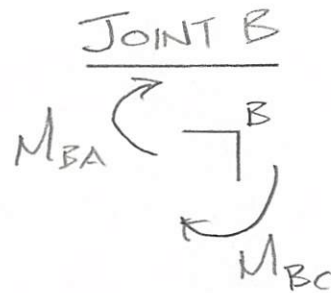
$$FEM_{BC} = \frac{WL^2}{8} = -\frac{2 \text{ k/ft} (9 \text{ ft})^2}{8} = -20.25 \text{ kft}$$

SECTION AB - 1 EQN

$$M_{BA} = \frac{3EI}{18 \text{ ft}} \left[\theta_B - \frac{1}{4} \right] + 162 \text{ kft} \quad (1)$$

SECTION BC - 1 EQN

$$M_{BC} = \frac{3EI}{9 \text{ ft}} \left[\theta_B - \frac{1}{4} \right] - 20.25 \text{ kft} \quad (2)$$



$$\sum M_B = 0$$

$$= -M_{BA} - M_{BC}$$

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

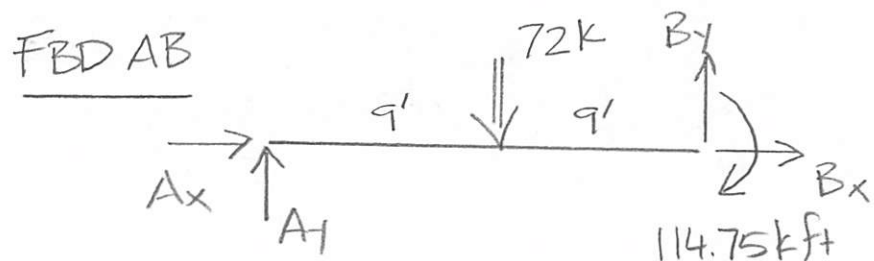
$$(3) \quad \frac{3EI}{18 \text{ ft}} \left[\theta_B \right] + 162 \text{ kft} + \frac{3EI}{9 \text{ ft}} \left[\theta_B \right] - 20.25 \text{ kft} \Rightarrow \frac{1}{2} \theta_B = -\frac{141.75 \text{ kft}^2}{EI}$$

$$\theta_B = -\frac{283.5 \text{ kft}^2}{EI}$$

Problem 10b-2 – Determine the reactions at the supports. Assume A and C are pins, B is fixed, and EI is constant.

$$M_{BA} = \frac{3EI}{18\text{ft}}(\theta_B) + 162\text{kft} = \underline{114.75\text{kft}}$$

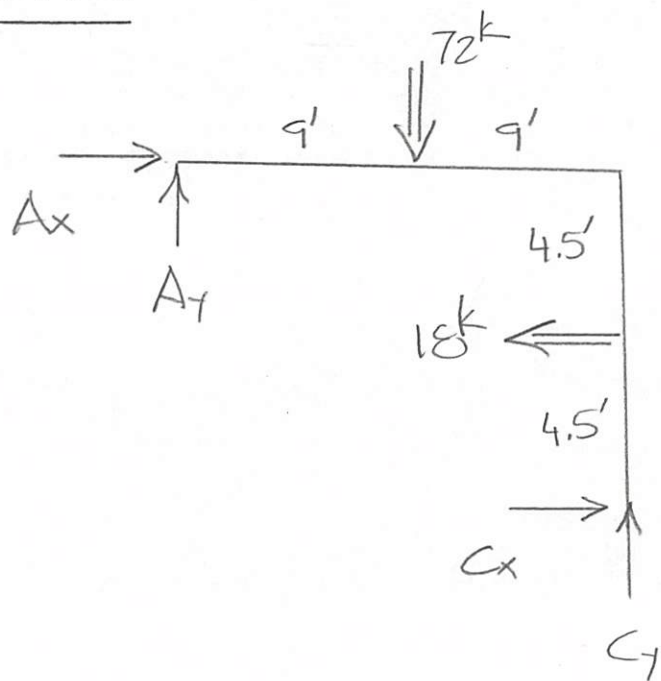
$$M_{BC} = \frac{3EI}{9\text{ft}}(\theta_B) - 20.25\text{kft} = \underline{-114.75\text{kft}}$$



$$\sum M_B = 0 = -114.75\text{kft} + 72\text{k}(9') - A_y(18')$$

$$\underline{A_y = 29.63\text{k}}$$

FBD ABC



$$\sum M_C = 0 = 18\text{k}(4.5') + 72\text{k}(9') - A_y(18') - A_x(9')$$

$$\underline{A_x = 21.75\text{k}}$$

$$+\uparrow \sum F_y = 0 = A_y + C_y - 72\text{k}$$

$$\underline{C_y = 42.38\text{k}}$$

$$+\rightarrow \sum F_x = 0 = A_x + C_x - 18\text{k}$$

$$\underline{C_x = -3.75\text{k}}$$