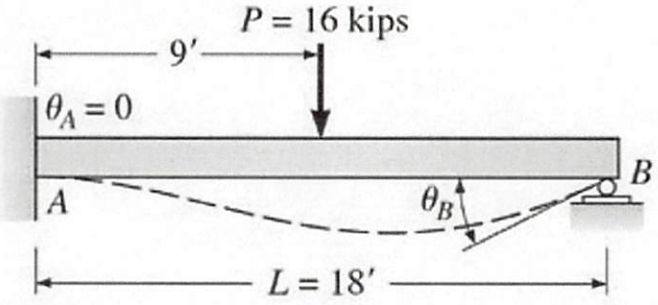
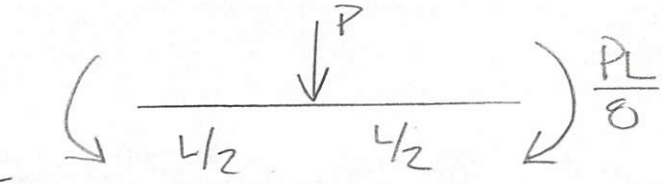
Problem 10a-1 – Determine the moment at *A*. Assume the support at *A* is fixed and *B* is a roller. *EI* is constant.



FEM



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

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

$$M_{BA} = \frac{2EI}{L_{AB}}\left[2\theta_B + \theta_A - 3\psi\right] + 36kft \quad (2) \Leftrightarrow \underline{M_{BA} = 0} \quad (3)$$

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

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

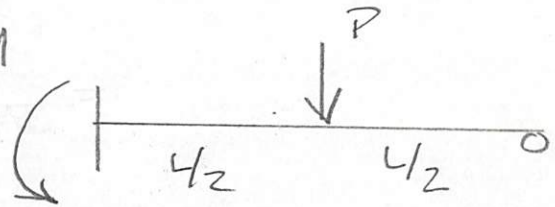
$$EI = \left[\frac{F}{L^2}\right]L^4 = FL^2$$

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

$$M_{AB} = \frac{2EI}{18ft}\left[\theta_B\right] - 36kft = \frac{2EI}{18ft}\left[-\frac{162kft^2}{EI}\right] - 36kft = \underline{\underline{-54kft}}$$

PINNED END SOLUTION

FEM



$$-\frac{3(16k)(18ft)}{16} = \underline{\underline{-54kft}}$$

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

$$M_{AB} = \frac{3EI}{L_{AB}}\left[\cancel{\theta_B}^{\,0}\right] - 54kft = \underline{\underline{-54kft}}$$