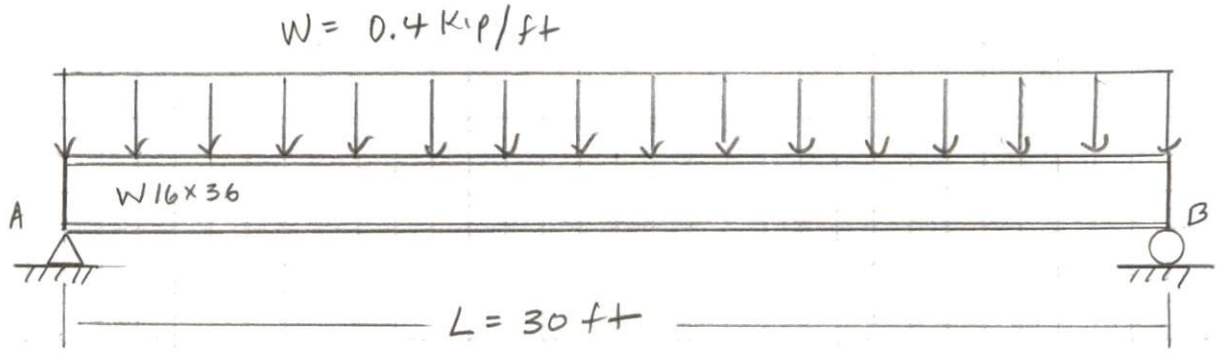
16-8

Rework Problem 16-7. Assume that a uniform load of 0.4 kip/ft is applied to the entire span.

Solution.




$E = 30\,000$ ksi

$L = 30\text{ ft}\left(\frac{12\text{ in}}{\text{ft}}\right) = 360\text{ in}$

$W = 0.4\ \text{kip/ft} \times \frac{\text{ft}}{12\text{ in}} = 0.0333\ \text{kip/in}$

$I = 448\ \text{in.}^4$

Table 16-1, case 7

$$\delta_{MAX} = \frac{5WL^4}{384EI} = \frac{5\left(0.0333\ \frac{\text{kip}}{\text{in}}\right)(360\text{ in})^4}{384\left(30000\ \frac{\text{kip}}{\text{in}^2}\right)(448\text{ in.}^4)}$$

$$= \frac{2,796,560,640\ \text{kip}\cdot\text{in}^3}{5,160,960,000\ \text{kip}\cdot\text{in}^2}$$

$$= 0.542\text{ in.}$$