

$$I := 1300 \text{ in}^4$$

Reference: E:\11-MATHCAD\Beam\Simple Span\partial_uniform.mcd(R)

Using Moment-Area Theorems:

End slope: $\theta_A := \frac{1}{E_s \cdot I \cdot L} \cdot \int_{0 \text{ ft}}^L M(x) \cdot (L - x) \, dx$ $\theta_A = 0.0019$ Guess: $j_{im} := \frac{L}{2}$

Zero Slope: Given $\theta_A - \left(\frac{1}{E_s \cdot I} \right) \cdot \int_{0 \text{ ft}}^{j_{im}} M(x) \, dx = 0$ $m_{ie} := \text{Find}(j_{im})$ $m_{ie} = 16.1 \text{ ft}$

Check that the slope = 0: $\theta_{mie} := \theta_A - \frac{1}{E_s \cdot I} \cdot \int_{0 \text{ ft}}^{m_{ie}} M(x) \, dx$ $\theta_{mie} = 0.0000$

Deflection: $\Delta_{\max} := \frac{1}{E_s \cdot I} \cdot \int_{0 \text{ ft}}^{m_{ie}} M(x) \cdot x \, dx$ $\Delta_{\max} = 0.23 \text{ in}$

Check: $\Delta_{\max} := \frac{1}{E_s \cdot I} \cdot \int_{m_{ie}}^L M(x) \cdot (L - x) \, dx$ $\Delta_{\max} = 0.23 \text{ in}$