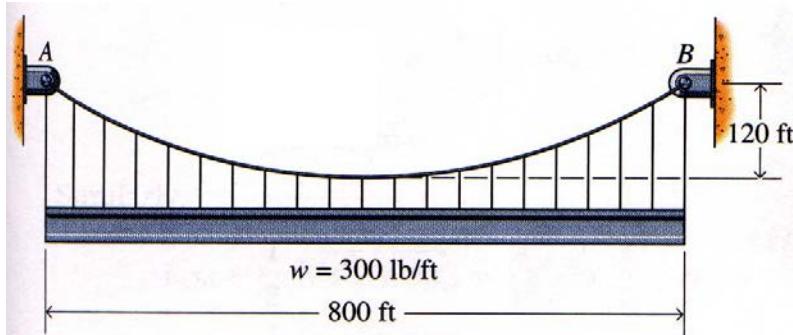
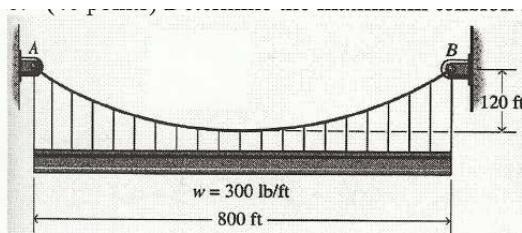


Problem 10: Determine the maximum tension in the cable and the length of the cable.





$$T_{\max} = \frac{wl}{2} \sqrt{1 + \left(\frac{l}{4h}\right)^2} = \frac{300(800)}{2} \sqrt{1 + \left(\frac{800}{4(120)}\right)^2} = 233,338 \text{ lbs}$$

$$L_{\text{tot}} = \frac{l}{2} \left[\sqrt{1 + \left(\frac{4h}{l}\right)^2} + \frac{l}{4h} \sinh^{-1}\left(\frac{4h}{l}\right) \right] = \frac{800}{2} \left[\sqrt{1 + \left(\frac{4(120)}{800}\right)^2} + \frac{800}{4(120)} \sinh^{-1}\left(\frac{4(120)}{800}\right) \right] = 846$$

ANSWER: $T_{\max} = 233 \text{ kips}$ Length = 846 ft