

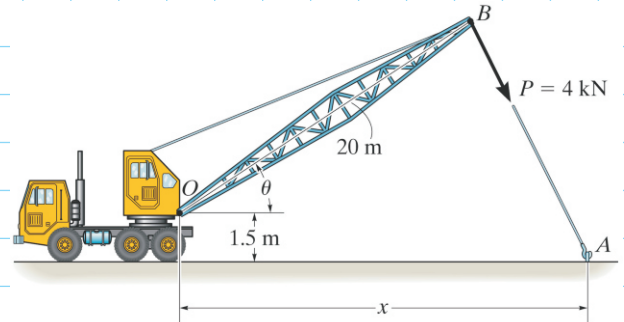


NAME

DATE

PROBLEM AP-17**GIVEN:**

The towline exerts a force of $P = 4 \text{ kN}$ at the end of the 20-m-long crane boom. If $\theta = 30^\circ$, determine the placement x of the hook at A so that this force creates a maximum moment about point O . What is this moment?

REQUIRED:**SOLUTION:****SOLUTION**

Maximum moment, $OB \perp BA$

$$\zeta + (M_O)_{\max} = -4 \text{ kN}(20) = 80 \text{ kN} \cdot \text{m} \zeta$$

$$4 \text{ kN} \sin 60^\circ(x) - 4 \text{ kN} \cos 60^\circ(1.5) = 80 \text{ kN} \cdot \text{m}$$

$$x = 24.0 \text{ m}$$