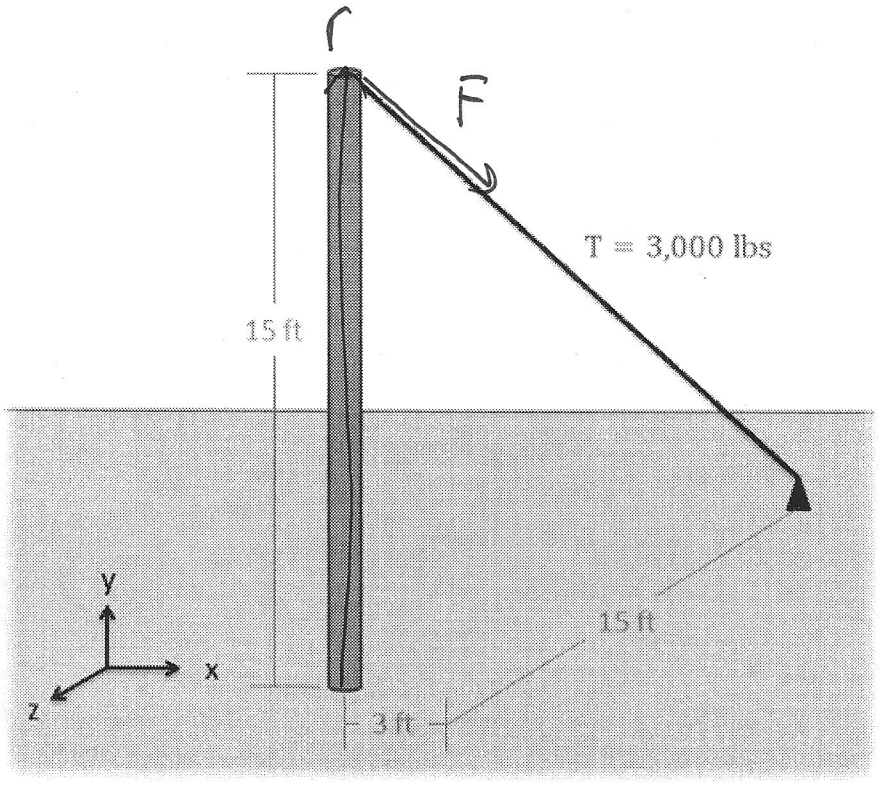
Question 2:

Determine the Moment that the tension in the cable exerts about the base of the pole (leave the moment in vector form). What is the magnitude of the moment the tension exerts about this point?



Calculations:

$$M = r \times F$$

$$r = [0, 15, 0] \text{ ft}$$

$$\bar{F} = (3000)\left[\frac{3}{h}, -\frac{15}{h}, \frac{-15}{h}\right]$$

$$h = \sqrt{3^2 + 15^2 + 15^2} = 21.4 \text{ ft}$$

$$F = [420.08, -2100.42, -2100.42] \text{ lbs}$$

$$r \times F = [-31,506.3, 0, -6301.2] \text{ ft lbs}$$

$$M = \sqrt{(-31,506.3)^2 + 0^2 + (-6301.2)^2}$$

$$M = 32,130.2 \text{ ft lbs}$$

Solution

$$\vec{M} = [-31,506.3, 0, -6301.2] \text{ ft lbs}$$

$$\bar{M} = 32,130.2 \text{ ft lbs}$$