

P #52

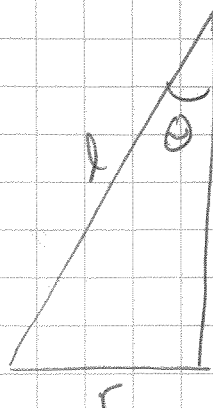
Ch 7

$$m = .50 \text{ kg}$$

$$l = 1.5 \text{ m}$$

$$\theta = 30^\circ \text{ from vertical}$$

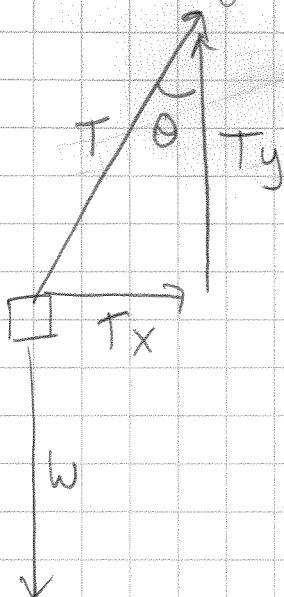
$$V_t = ?$$

Find r :

$$\sin \theta = \frac{r}{l}$$

$$\text{so } \sin 30^\circ = \frac{r}{1.5 \text{ m}}$$

$$r = .75 \text{ m}$$

Find F_c (equal to T_x)

$$T_y = W = m \cdot g$$

$$= (.50 \text{ kg})(9.8 \text{ m/s}^2)$$

$$T_y = 4.9 \text{ N}$$

Find T_x (equal to F_c):

$$\tan \theta = \frac{T_x}{T_y} \quad \text{so} \quad \tan 30^\circ = \frac{T_x}{4.9 \text{ N}}$$

$$F_c = T_x = 2.83 \text{ N}$$

Find V_t :

$$F_c = \frac{m \cdot V_t^2}{r}$$

$$\text{so } 2.83 \text{ N} = \frac{(.50 \text{ kg}) \cdot V_t^2}{(.75 \text{ m})}$$

$$V_t = 2.1 \text{ m/s}$$