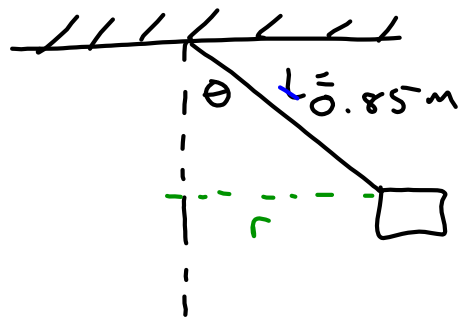


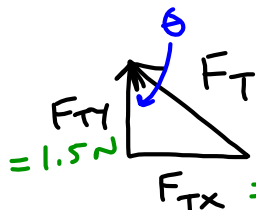
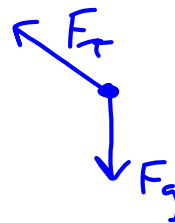
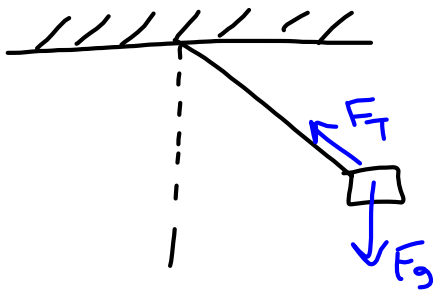
# FLYING PIG



$$r = 0.4 \text{ m}$$

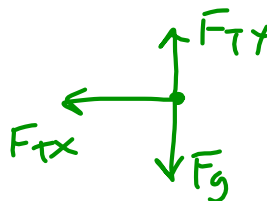
$$\sin \theta = \frac{r}{L}$$

$$\theta = \sin^{-1}\left(\frac{0.4 \text{ m}}{0.85 \text{ m}}\right) = 28.1^\circ$$



$$F_{Ty} = 1.5 \text{ N}$$

$$F_{Tx} = 0.884 \text{ N}$$



$$\tan \theta = \frac{F_{Tx}}{F_{Ty}}$$

$$\theta = \tan^{-1}\left(\frac{0.884 \text{ N}}{1.5 \text{ N}}\right)$$

$$= 30.51^\circ$$

$$F_{Tx} = m a_c$$

$$= m \frac{v^2}{r}$$

$$= (0.153 \text{ kg}) \frac{(1.52 \text{ m/s})^2}{(0.4 \text{ m})} = 1.52 \text{ N}$$

$$= 0.884 \text{ N}$$

$$v = \frac{2\pi r}{t}$$

$$= \frac{2\pi(0.4 \text{ m})}{1.65 \text{ s}}$$

$$m = \frac{F_g}{a_g}$$

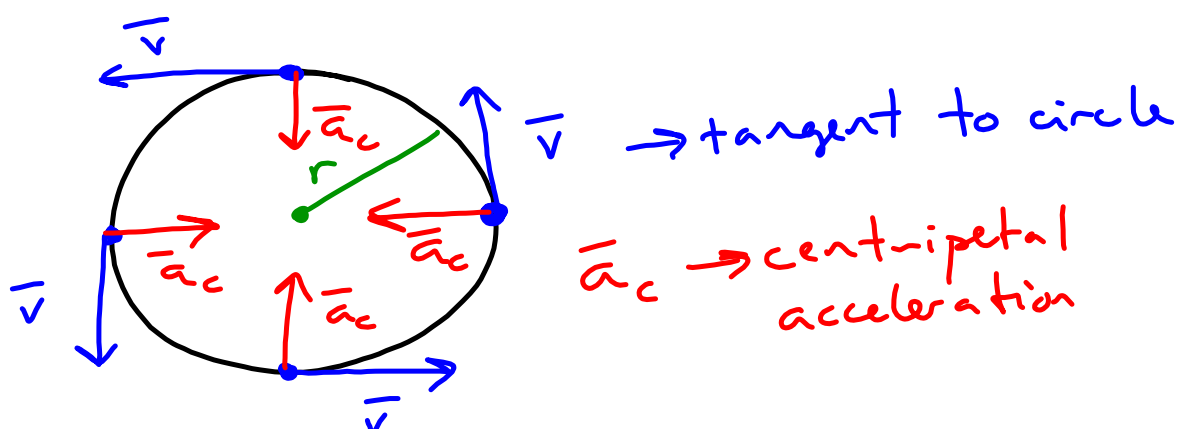
$$= \frac{1.5 \text{ N}}{9.8 \text{ m/s}^2}$$

$$= 0.153 \text{ kg}$$

$$\% \text{ difference} = \left(\frac{30.5^\circ - 28.1^\circ}{30.5^\circ}\right) \cdot 100\%$$

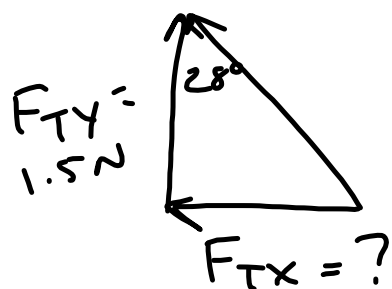
$$= 7.8\%$$

- Centripetal force is a force that causes an object to have circular motion.
- Centripetal acceleration is acceleration towards the center of circular motion.
- There is no such thing as a centrifugal force.



$$a_c = \frac{v^2}{r}$$

$$v = \frac{d}{t} = \frac{2\pi r}{t}$$



$$\tan(28^\circ) = \frac{F_{TX}}{F_{TY}}$$

$$\begin{aligned} F_{TX} &= F_{TY} \tan(28^\circ) \\ &= 0.53 \text{ N} \end{aligned}$$