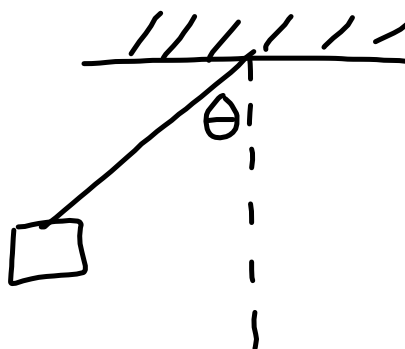
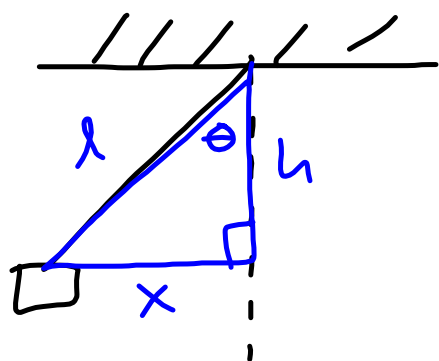


## LAB - FLYING PIGS

- Determine the angle between the vertical and string attached to the pig.



## Geometry



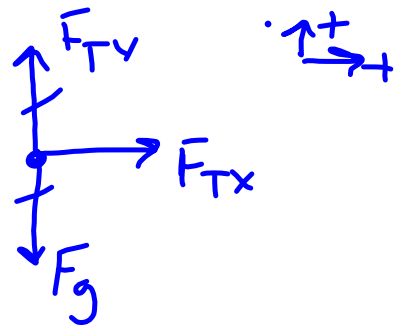
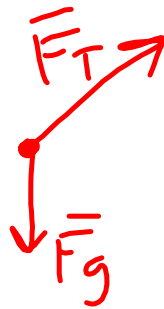
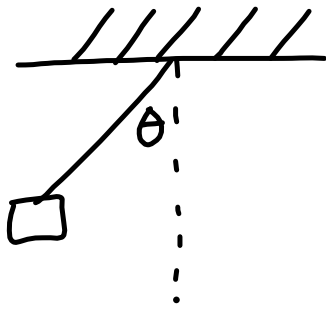
Find two of the  
three sides.  
(String =  $l$ )

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

$$\theta = \sin^{-1}\left(\frac{x}{l}\right)$$

# Forces

- Centripetal force  $\rightarrow$  label for the force that causes the object to move in rotational motion



$$\Sigma \vec{F}_y = 0$$

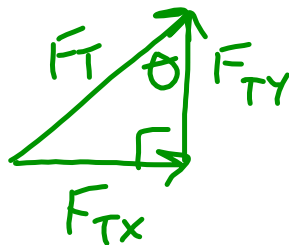
$$F_{Ty} - F_g = 0$$

$$F_{Ty} = F_g$$

$$= m a_g$$

$$= (0.135 \text{ kg})(9.8 \text{ m/s}^2)$$

$$= 1.32 \text{ N}$$



$$F_{Tx} = F_c$$

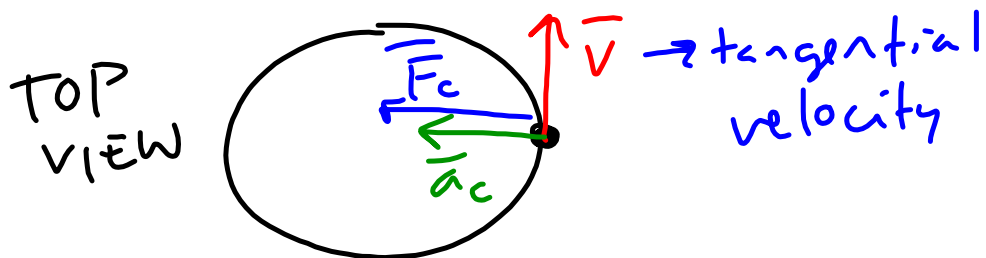
$$= \frac{m \left( \frac{2\pi r}{\Delta t} \right)^2}{r}$$

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

## • Centripetal Force

$$F_c = m a_c$$

centripetal force  $\swarrow$   $\downarrow$  mass  $\swarrow$  centripetal acceleration



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

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

$$\begin{aligned}
 F_c &= m a_c \\
 &= \frac{m v^2}{r} \\
 &= \frac{m \left( \frac{2\pi r}{\Delta t} \right)^2}{r}
 \end{aligned}$$