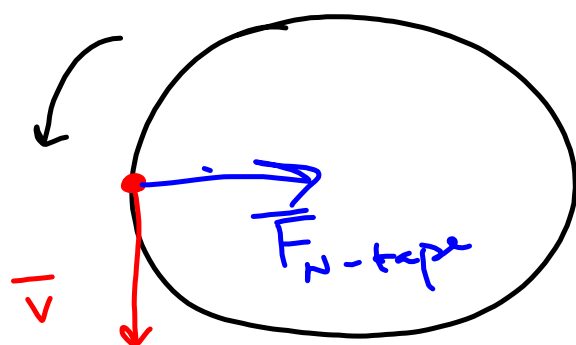
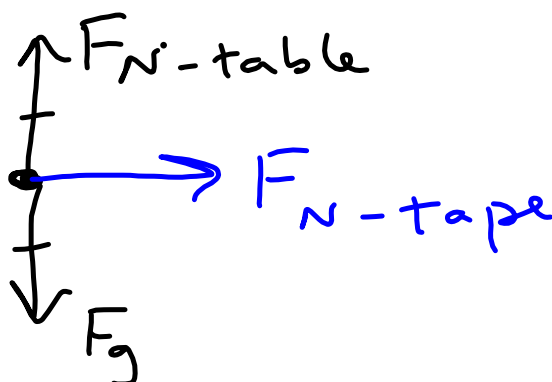


Circular Motion

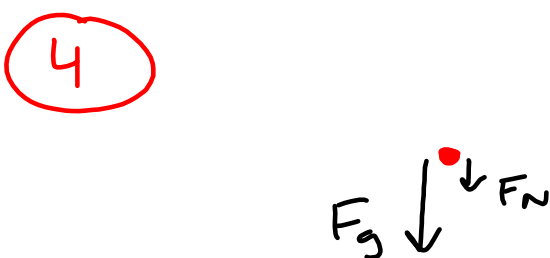
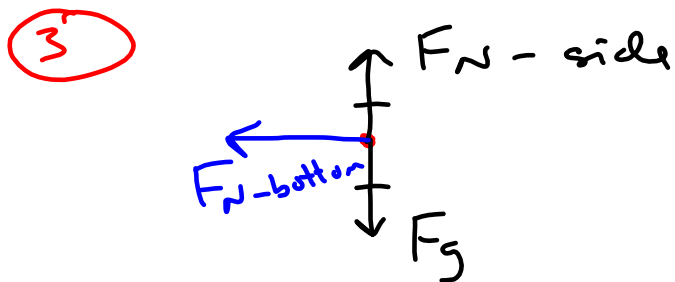
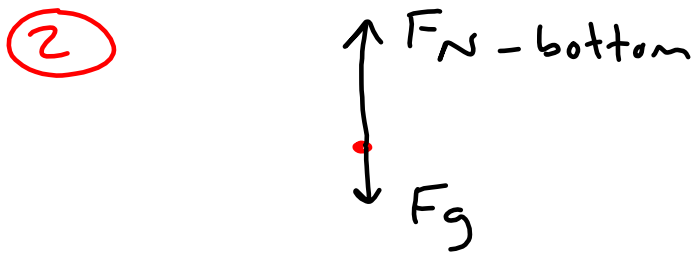
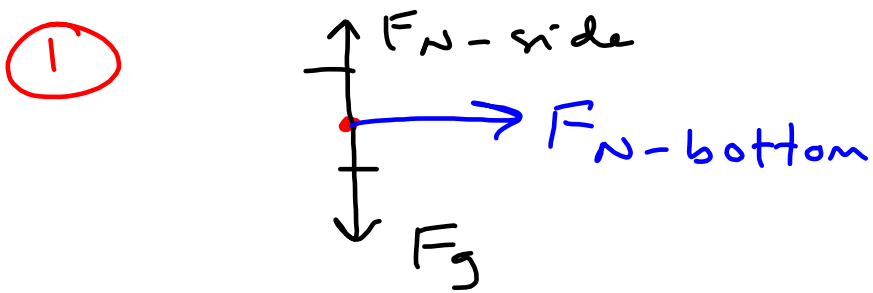
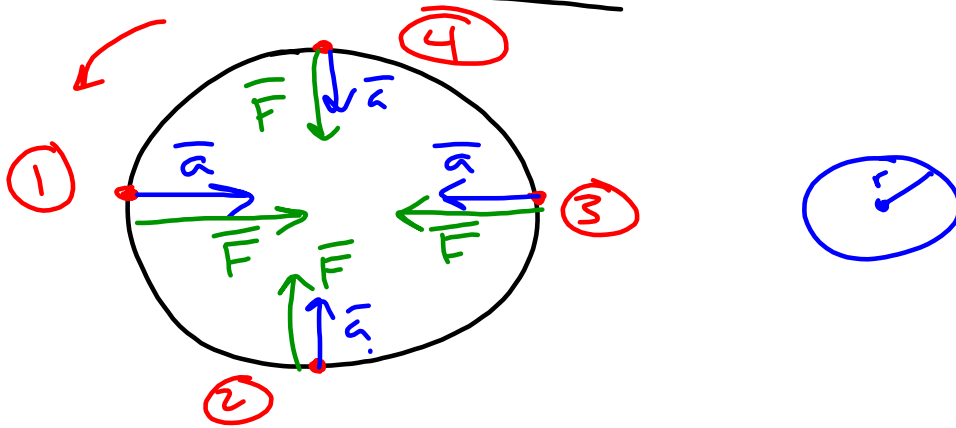


(ball coming toward you)

FBD looking from side:



Swinging Bucket



Mathematics

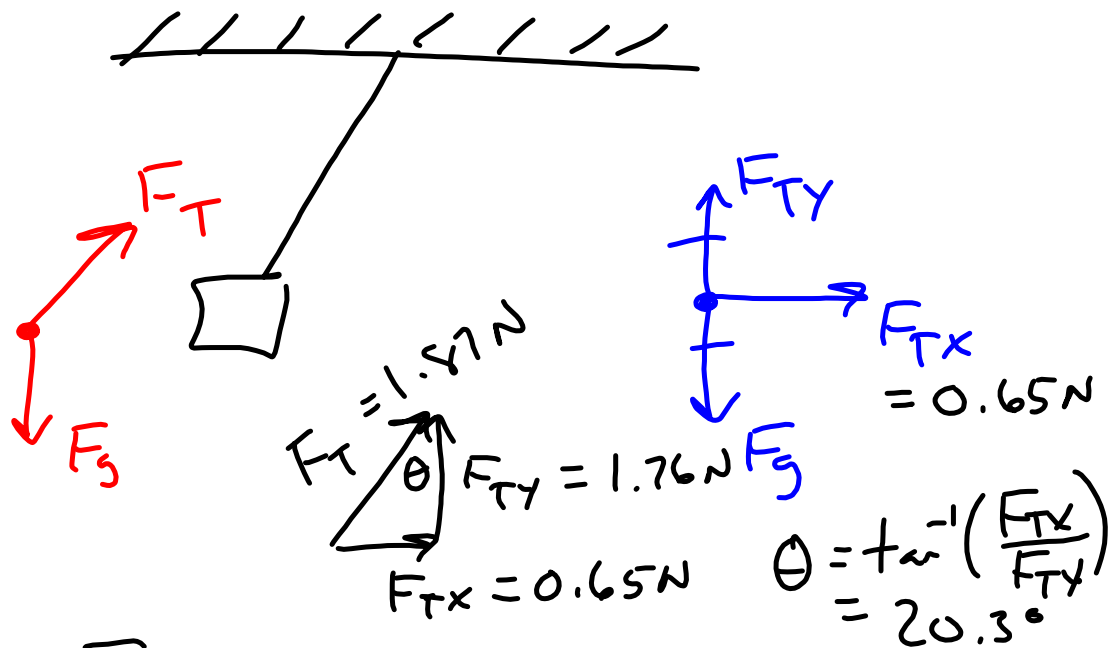
$$a_c = \frac{v^2}{r} \quad \frac{\text{velocity}}{\text{radius}}$$

Centripetal
acceleration

$$F_c = \frac{mv^2}{r}$$

Centripetal
force

$$\left[\frac{\text{kg} \cdot \text{m}^2 / \text{s}^2}{\text{m}} = \frac{\text{kg} \cdot \text{m}}{\text{s}^2} = \text{N} \right]$$



$$\begin{aligned}
 F_{Tx} &= m a \\
 &= \frac{m v^2}{r} \\
 &= \frac{m \left(\frac{\text{circumference}}{\text{time}}\right)^2}{r} \\
 &= \frac{(0.18 \text{ kg}) \left(\frac{2.04 \text{ m}}{1.88 \text{ s}}\right)^2}{0.325 \text{ m}} \\
 &= 0.65 \text{ N}
 \end{aligned}$$