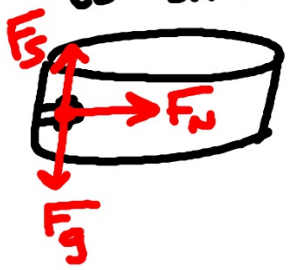
Bellwork 4/26

An object moves in a circular path of radius r at a tangential speed v. Would it take more or less force for the object to move in a smaller circle at the same speed? How is T affected?

① what is minimum speed needed to drive on wall



$r = 7m$

$\mu_s = 0.5$

$\Sigma F_c = ma_c$

$F_N = ma_c$

$F_N = m\left(\frac{v^2}{r}\right)$

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

$v = \sqrt{\frac{(9.8\frac{m}{s^2})(7m)}{0.5}}$

$v = 11.7\frac{m}{s}$

$\Sigma F_y = ma_y$ ($a_y = 0$)

$F_s - F_g = 0$

$F_s = F_g$

$\mu_s F_N = mg$

$F_N = \frac{mg}{\mu_s}$

Getting Air

How fast does car have to go to **lose contact** with hill at the top?

$F_N = 0$

FBD

$$\Sigma F_c = m a_c$$

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

$$mg = m \frac{v^2}{r} \Rightarrow \boxed{v = 49 \frac{m}{s}}$$

$$v = \sqrt{9.8 \frac{m}{s^2} \cdot 240 m}$$