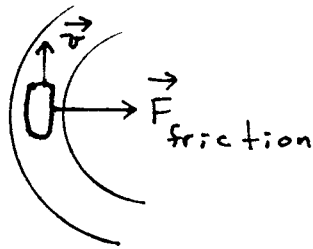


Exercise 9-5

Top
view



$$\Sigma F = m a_c$$

$$\therefore F_{\text{friction}} = m \frac{v^2}{r}$$

On verge of slipping,

$$F_{\text{friction}} = F_{\text{max}} = \mu_s N$$

The only vertical forces are

$$m \vec{g} \text{ (down) } \& \vec{N} \text{ (up)} \Rightarrow N = mg.$$

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

$$\therefore \mu_s = \frac{v^2}{rg} = \frac{(27.0 \text{ m/s})^2}{(320 \text{ m})(9.80 \text{ m/s}^2)} = 0.232$$

If r is smaller, then from $\mu_s = \frac{v^2}{rg}$, μ_s would have to be larger, i.e., it would have to increase.