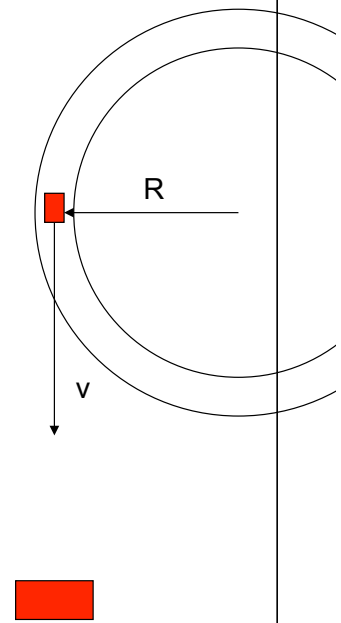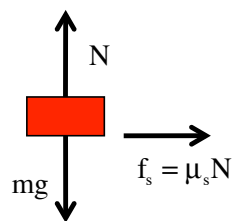What's maximum velocity a car can take a flat curve of radius "R" is the coefficients of friction are μ_s and μ_k respectively?
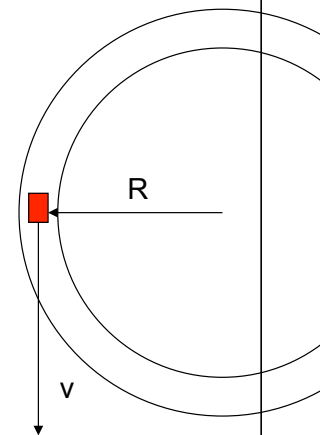
R

v

1.)

Start with a free body diagram as viewed from the front of the car:

As viewed head-on:

N

mg

$f_s = \mu_s N$

R

v

As the static frictional force is in the center seeking direction, N.S.L. becomes:

$$\sum F_{c.s.}$$

$$\mu_s N = ma_{c.s.}$$

$$\Rightarrow \quad \mu_s(mg) = m\left(\frac{v^2}{R}\right)$$

$$\Rightarrow \quad v = \sqrt{\mu_s R g}$$

2.)