Answer on Question #62399 – Physics – Mechanics – Relativity

Question:

A car travels along a horizontal road which is an arc of a circle of radius 125 m. The greatest speed at which the car can travel without slipping is 42 km/h. Find the coefficient of friction between the tyres of the car and the surface of the road.

Answer:

Using Newton's second law we will have:

$\overrightarrow{F_f} = m\vec{a};$

$$\begin{cases} F_f = kmg, \\ a = \frac{v^2}{R}; \end{cases}$$

$kmg = m\frac{v^2}{R} \Rightarrow k = \frac{v^2}{gR};$

$k = \frac{1}{9} \approx 0.111;$