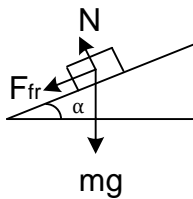**Answer on question #79846, Physics / Mechanics**

    a. Find the angle of banking for a highway curve of 90 m radius designed to accomodate cars travelling at 160 kph if the coefficient of friction between the tires and the road is 0.5 .

    b. b. What is the rated speed of the curve?

Solution

A projection on the axis X: $N \cdot \sin \alpha + \mu N \cdot \cos \alpha = \dfrac{mv^2}{R}$

A projection on the axis Y: $N \cdot \cos \alpha + \mu N \cdot \sin \alpha - mg = 0$

From here: $tg\, \alpha = \dfrac{v^2 - \mu g R}{v^2 \mu + g R} = 0.81$

$\alpha = 39°$

Max. speed of the curve is 160 kph