

Answer on Question #41985 – Physics – Other

Question: a 935 kg car is travelling around an unbanked curve that has a radius of 79 m. If maximum speed that the car can go around the corner is 22.5 m/s, what is the coefficient of kinetic friction between the asphalt and the rubber tires?

Solution: in the radial direction on the car acts the friction force $f = \mu N$, N – normal force that is equal to mg . The car moves with the circular acceleration

$$a = \frac{v^2}{r}$$

From the second Newton's law we obtain

$$\mu N = \mu mg = \frac{mv^2}{r}$$

Finally, the coefficient of kinetic friction between the asphalt and the rubber tires is

$$\mu = \frac{v^2}{gr} = \frac{(22,5)^2}{9,8 \cdot 79} = 0,65.$$

Answer:

$$\mu = \frac{v^2}{gr} = 0,65.$$