Centripetal acceleration and force

When moving along a circular path with constant speed v, an object has acceleration directed towards the center, called Centripetal Acceleration:

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

Homework

Problem 1

Friction coefficient between the cars wheels and the road is μ= 0.7. Find the maximum speed with which it can move on a curved road without slipping, if the radius of curvature of the road is R=20m.

Problem 2

An airplane in order to turn must roll to a banked position (see picture) so that its are angled towards the desired direction of the turn. Find the radius of such a turn, if the bank angle is θ=5º, and speed is v=700 km/hr
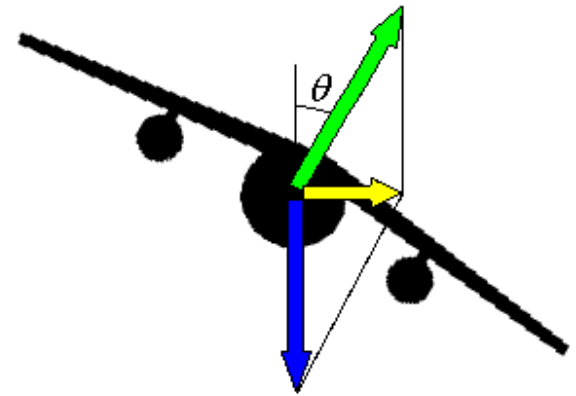
➡ Lift force
➡ Weight
➡ Centripetal force