Homework 5 - Empirical interactions

Q5.1. Calculate the speed in $\mathrm{km\,h^{-1}}$ which maximizes the safe flow of traffic. Assume all vehicles have length 4.5 m, driver reaction time 1 s, and coefficient of friction between tires and road 0.8. For the safe flow of traffic, the separation between vehicles should be at least the minimum distance in which a vehicle can stop.

Q5.2. A ball of radius R is moving directly towards a wall with speed v, and is spinning with angular speed w in a plane perpendicular to the wall. The coefficient of kinetic friction between the ball and the wall is μ, and you can assume that the normal force acts elastically. Calculate the angle at which the ball bounces off the wall.