When viewed from above, a portion of highway has a radius of curvature $R$, as shown in the sketch. The speed limit for this portion of the highway is $v_0$. The road surface is designed with a banking angle $\theta$ to improve safety and driving comfort.

a. Find the banking angle such that no lateral frictional force is required to assist the turning when the car is traveling at the speed limit.

b. Given the banking angle in Part 1, if the coefficient of friction between the road surface and the rolling tires is $\mu$, find the maximum speed of a car such that it will not slip.

c. Suppose along a section of unbanked ($\theta = 0$) but curved roadway, the tires instantaneously lose all their traction with the road surface ($\mu = 0$), causing the car to leave the highway. Describe the trajectory of the car during the initial period of this event.