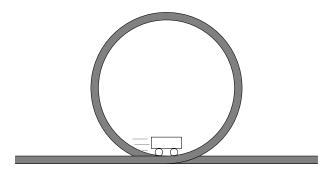
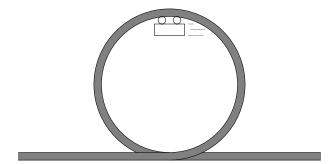
## Multi-Force Circular Problem (Consolidation)

A roller coaster car of mass  $600~\mathrm{kg}$  goes around a loop of radius  $8~\mathrm{meters}$  with an (assumed constant) speed of  $9~\mathrm{m/s}$ .

(a) Find the normal force of the track on the coaster at the bottom of the loop.



(b) Find the normal force of the track on the coaster at the top of the loop.



(c) What is the minimum speed the car needs to not fall off at the top of the loop?

