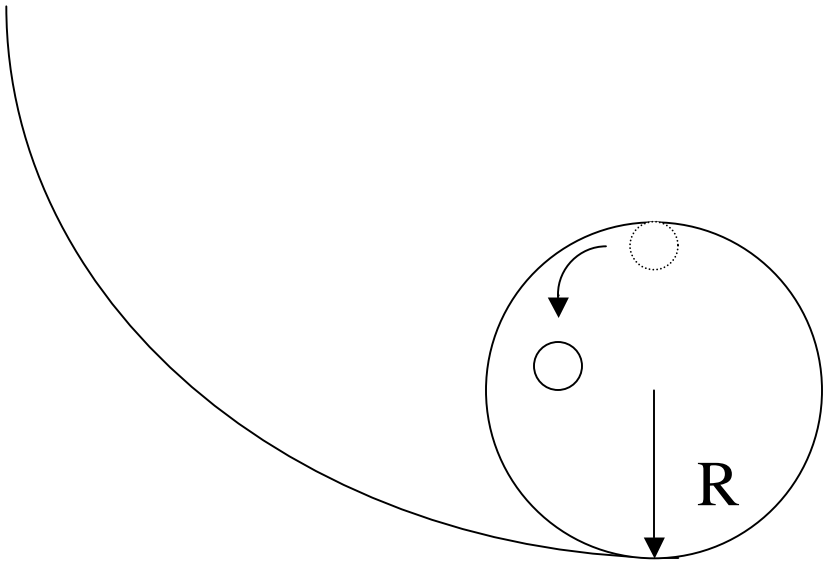
Condition for Ball Losing Contact w/ Loop

Use the concept of centripetal force to determine the speed of the ball v_t at the top of the loop, if it were to lose contact with the track at the highest point of the loop [Hint: Draw the FBD of the ball at the top of the track. When the ball loses contact with the track, the normal force acting on it becomes 0].



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If R = radius of loop and r = radius of ball, this speed v_t is given by:

a.) 0

b.) $\sqrt{gh}$

c.) $g(R-r)$

d.) $2gR$

e.) $\sqrt{g(R-r)}$