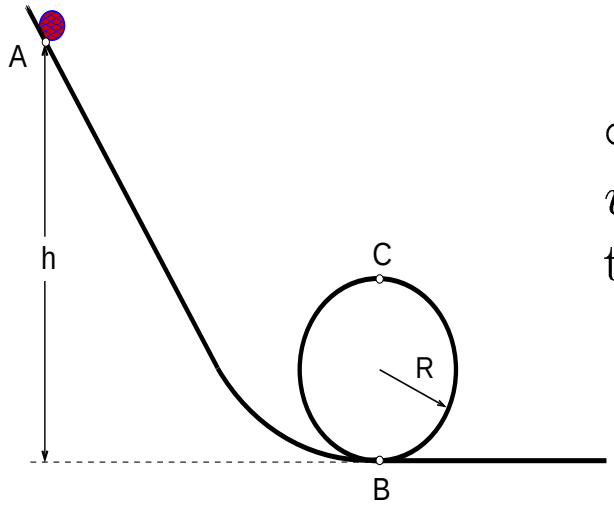
Ex : Consider rolling a ball through a loop.



- Determine minimum value of v_C to just stay in contact with the loop.

- Question : What variables should our answer depend on?

- Begin with free-body diagram (as usual).

- Use Newton's second law: $\Sigma \vec{F} = m\vec{a}$

$$\Sigma F = -mg - N = ma = -\frac{mv^2}{R}$$

- What is N when ball is just about to lose contact?

$$-mg = -\frac{m(v_{C,min})^2}{R}$$

$$v_{C,min} = \sqrt{gR}$$