A small solid ball of mass m and radius r, is started at rest and rolls without friction down the loop-the-loop shown. (h = 4R.) Assume r << R.

(a) Calculate the normal force of the track on the ball at point A, exactly opposite the center of the loop. (Your answer should be expressed as the weight of the ball times a number.)

(b) Calculate the normal force on the ball at point B, exactly at the top of the loop. (Your answer should be expressed as the weight of the ball times a number.)

\[ N = \frac{m v^2}{R} = m \cdot \frac{30}{7} \cdot 8 = \frac{30 \cdot m g}{7} \]

\[ V = \frac{30}{7} \cdot 8 \cdot R = 4.29 m g \]

\[ V^2 = \frac{30}{7} \cdot 8 \cdot R \]

\[ m g R = m g R + \frac{1}{2} m v^2 \]

\[ \Rightarrow \frac{m v^2}{R} = \frac{13}{7} \cdot m g \]

\[ = 1.86 \cdot m g \]