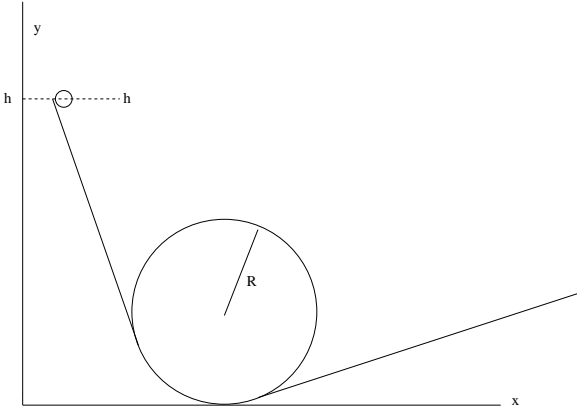


Physics 141
Quiz 6
Tuesday, Dec. 2, 2008

Name:

1 Problem (Recommended time 15 minutes)



A ball rolls down a ‘loop-the-loop’, like the one in class, starting at a height h from the bottom. The loop is a circle of radius R (the silly computer has made my nice circular loop into an ellipse- ignore that- it’s a circle).

a) (8 points) Calculate the force *exerted by the loop* on the ball when the ball is at the top of the loop? (magnitude and direction).

b) (2 points) If $R = 1$ foot and $h = 5$ feet, and the ball weighs a pound, calculate the magnitude of the force in Newtons. (Please do *not* use a calculator! Main thing is to get the answer close enough (‘enough’- as explained in Taylor)).

Extra Credit- 1 Point.

Consider the vectors $\vec{\zeta} = (0, 0, -3)$, $\vec{\omega} = (0, 1, 0)$. Find the unit vector for the cross-product $\vec{\zeta} \times \vec{\omega}$.