

HW08a

Monday, September 5, 2016 5:02 PM

Vertical circle:

$$\text{Top: } \dot{N} = M \left(\frac{v^2}{R} - g \right) = 9.8 \text{ N}$$

$$\text{Bottom } N = M \left(\frac{v^2}{R} + g \right) = 33.4 \text{ N}$$

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

$$\text{Bead: } \theta = \arccos \left(\frac{gT^2}{4\pi^2 L} \right)$$

Banked curve:

$$v_{\max}^2 = gR \frac{\sin \theta + \mu_s \cos \theta}{\cos \theta - \mu_s \sin \theta}$$

$$v_{\min}^2 = gR \frac{\sin \theta - \mu_s \cos \theta}{\cos \theta + \mu_s \sin \theta}$$

$$\text{Non uniform: } N = M \left(g \cos \theta + \frac{v^2}{R} \right)$$

$$\frac{dv}{dt} = g \sin \theta$$