a)

$$\Sigma F_y = N - mg = ma$$

$$N - mg = m\ddot{y}$$

b)

$$\Sigma F_x = 0$$

$$y = \frac{L}{2}\cos\theta$$

$$\ddot{y} = -\frac{L}{2}\sin(\theta)\,\ddot{\theta}$$

$$F \cdot d = T$$

$$N \cdot \frac{L}{2}\sin\theta = T_N \quad ; \quad mg \cdot 0 = T_P$$

$$I\ddot{\theta} = N\frac{L}{2}\sin\theta$$