c)

$x = l\cos\theta$ $\quad \dot{x} = -L\sin\theta\,\dot{\theta}$ $\quad \ddot{x} = -L\cos\theta\,\dot{\theta}^2 - L\sin\theta\,\ddot{\theta}$

$y = L\sin\theta$ $\quad \dot{y} = L\cos\theta\,\dot{\theta}$ $\quad \ddot{y} = -L\sin\theta\,\dot{\theta}^2 + L\cos\theta\,\ddot{\theta}$

$$\vec{F} = m\vec{a}$$

$$mg = \vec{F} = m(\ddot{x}^2 + \ddot{y}^2) = m\left((-L\cos\theta\,\dot{\theta} - L\sin\theta\,\ddot{\theta})^2 + (-L\sin\theta\,\dot{\theta} + L\cos\theta\,\ddot{\theta})^2\right]$$

$$\ddot{\theta} = \frac{(2g/L - \dot{\theta}\cos\theta)\sin\theta}{1/3 + \sin^2\theta}$$