1.

$$-2ab\big(1+m^2\big)\left(\frac{2\sin\theta\cos\theta}{L}-\frac{2abm\sin^3\theta}{L^2}\right)+\frac{dm}{d\theta}\left(-\frac{4abm\sin^2\theta}{L}+\cos\theta\right)-m\sin\theta-\cos\theta$$