

HW1: Linear pendulum

1. Pendulum length is $l = 24.88 \text{ m}$, the gravitational constant is $g \simeq 9.81 \text{ m/sec}^2$, find the period of oscillation T and the angular frequency ω_0 .
2. Pendulum length is $l = 24.88 \text{ m}$, the gravitational constant is $g \simeq 9.81 \text{ m/sec}^2$, find the total energy of the pendulum and the solution of the following initial value problem:

$$\begin{aligned}\ddot{\theta} + \omega_0^2 \theta &= 0, \\ \theta(0) &= 0, \\ \dot{\theta}(0) &= 0.3.\end{aligned}$$