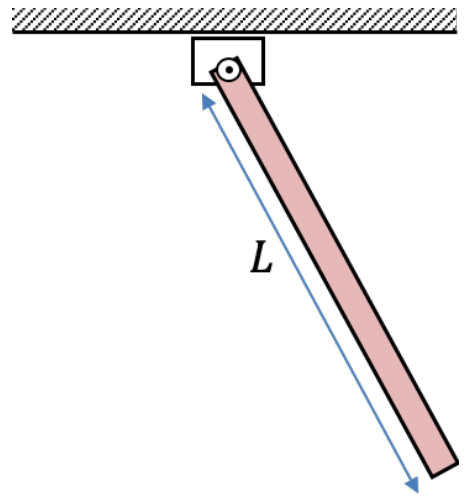
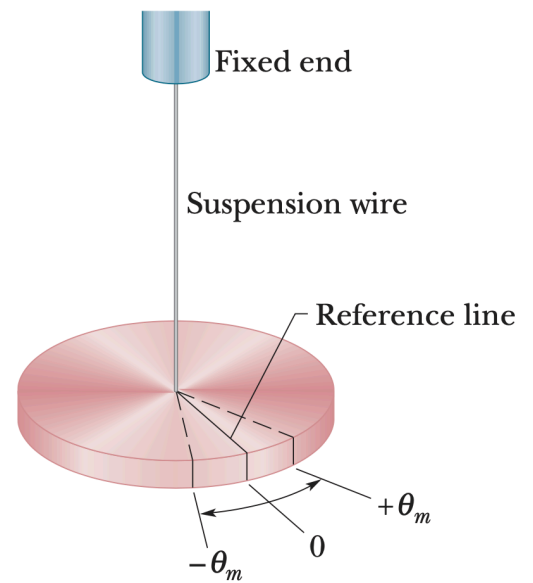


A **physical pendulum** is formed from a uniform rod of mass M and length L , pivoted at one end. The rod is displaced a small angle θ_0 from the vertical and released from rest.



- Write the differential equation describing the simple harmonic motion of the rod.
- Solve the differential equation to get the angular position as a function of time $\theta(t)$.
- Determine the period.

A **torsion pendulum** is formed from a uniform disk of mass M and radius R , suspended from its center by a wire with torsion constant κ . Rotating the disk in either direction introduces a restoring torque given by $\tau = -\kappa\theta$. The disk rotated an angle θ_m from the equilibrium position and released from rest.



- Write the differential equation describing the angular simple harmonic motion of the disk.
- Solve the differential equation to get the angular position as a function of time $\theta(t)$.
- Determine the period.