Suppose you have a particle that starts at $x = 2$ m and oscillates around an equilibrium position of $x = 0$ with a period of 1 sec. What is the position as a function of t?

A spring that hangs on its initial equilibrium position gets extended by 1 m after a 100 kg mass is hung on its end. What is the period of oscillation for this system if the mass is pulled down a little?

Find the energy of the simple pendulum with mass m and length L exactly.

Suppose you have a spring system where you have a single mass, m, that has springs on both sides. The left spring and right spring both have spring constant k. Find the equation that governs the motion from newton's second law. What is the solution?

Show that $x(t) = A\sin(\omega t - kx)$ satisfies the wave equation, where ω and k are some constants. Find the relation between ω, k, and v so that the wave equation is satisfied.

As you run toward a person, you emit a sound at a fixed frequency of 300 Hz. What frequency does the person hear??