Unit Five
Periodic Motion

Relationships

$$\omega == \frac{2\pi}{T}$$

$$T = 2\pi\sqrt{\frac{L}{g}}$$

$$T = 2\pi\sqrt{\frac{m}{k}}$$

$$x = A\cos(\omega t)$$

You should be able to:

1. sketch the x vs t graph for harmonic motion (pendulums, masses on springs)
2. analyze an x vs t graph to determine A, λ, T and f.
3. identify locations in the motion where v, a, a_c, A, PE, KE are minimum and maximum values.
4. relate acceleration to displacement.

5. solve problems for speed, frequency and wavelength.
6. explain that the total energy of an oscillating system is dependent on amplitude and sketch the graph of PE and KE vs. time.
7. calculate the PE or KE of an oscillating system and show that energy is constant.
8. apply the relationship for the period of a mass on a spring and a pendulum.
9. state what approximations must be made in solving for the period.