A-Day Due Fri., Mar 26
B-Day: Due Mon., Mar 29

2009-10 PreAP Harmonic Motion 1

Harmonic Motion: Yes or No?

Pendulum: _____

Ocean waves: _____

A child on a swing: _____

Jumping Jacks: _____

Bouncing spring: _____

A bouncing ball: _____

A ruler pulled from one side and released: _____

A person jumping up and down: _____

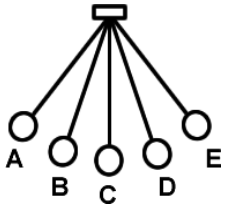
A spinning ball: _____

1. Period
2. Equilibrium position
3. Amplitude
4. Damping
5. Frequency
6. Cycle
7. Hertz

A. The number of cycles per second.
B. A unit of one cycle per second.
C. The size or strength of a cycle.
D. Time it takes to complete one cycle.
E. A part of motion that repeats over and over with a set series of events.
F. Halfway between the two sides and where the motion comes to rest.
G. The motion dying out over time.

Period, Frequency, or Amplitude?

____ Doesn't change period.
____ More of this means more energy.
____ Increases as a pendulum swings back and forth faster.
____ Measured in cycles per second.
____ Measured in meters or centimeters.
____ This decreases with a smaller swing.
____ If the frequency increases, this decreases.
____ Measured in Hertz.
____ Measured in seconds.
____ If it swings back and forth slower, this decreases.
____ As it dampens, this decreases.



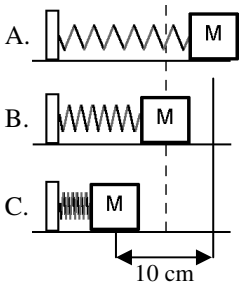
Where is the equilibrium position for this pendulum?

If the pendulum starts at C going to the right, where does 1 cycle end?

From letter A to letter ____ would be the amplitude.

If the pendulum starts at A, how many times does it pass point C in 1 cycle?

A moving spring



Where is its equilibrium position?

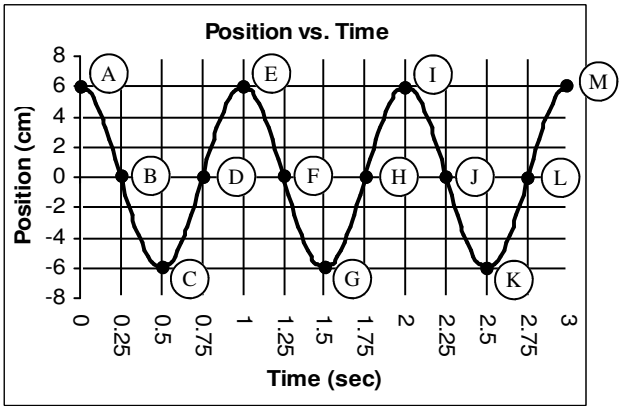
If the spring starts at position A, how much of a cycle does it complete from A to C?

If the spring moves 10 cm from C to A (side to side), how big is it's amplitude?

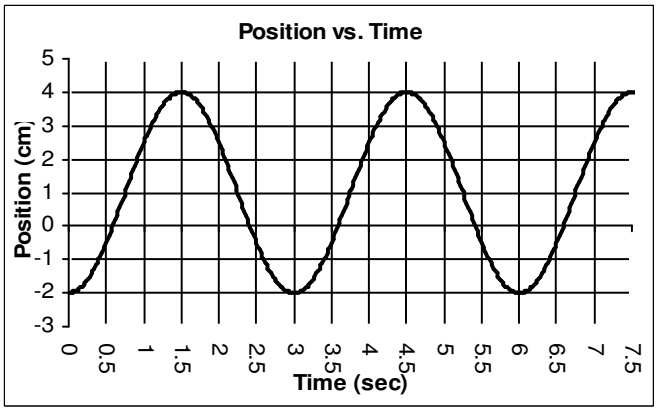
An spring has a period of 4 seconds. What is its frequency?

A pendulum has a frequency of 3 Hz. What is its period?

A pendulum takes 10 seconds to complete 2 cycles.
A) What is its period?
B) What is its frequency?



1 cycle after A is ____; 2 cycles after D is ____.
1/2 cycle after G is ____; 1/4 cycle before M is ____.
# of complete cycles shown is ____.
Period (T) = Frequency (f) =
Equilibrium position = Amplitude (A) =



Mark 1 cycle of the harmonic motion.
Starting at 1.5 secs, when does the 2nd cycle end:
Number of cycles shown is ____.
Period (T) = Frequency (f) =
Equilibrium position = Amplitude (A) =

1. Give the variables and units for the following quantities:
   A. Period: _____; B. Amplitude: _____; C. Frequency: _____; D. Wavelength: _____

2. If the period of a pendulum is 4 seconds, find the frequency of the pendulum.

Use your "Harmonic Motion Table" notes for the following.

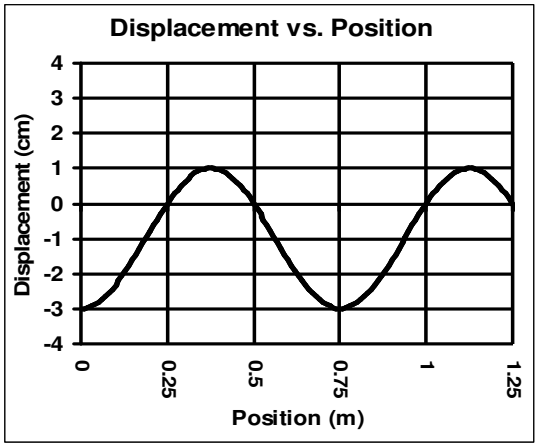
3. What is "dampening"?

4. What is the equation for the speed of a wave?

5. What do we call this symbol: λ?

6. A wave is moving 25 m/s and has a frequency of 80 Hz. What is the wavelength of the wave?

7. What is the ***medium*** that sound travels thru to your ears?



8. On the graph at the right…
   A. What is the wavelength of the wave?
   B. Mark a trough and a crest.

9. For sound, how many decibels is twice as loud?

10. If a sound is 40 dB, how many decibels is twice as loud?

11. Find the period of a pendulum that is 80 cm long, realizing to use standard units.

12. How long is a pendulum that has a period of 0.84 seconds?

13. What is the period of a spring-mass system if the spring has a spring constant of 25 N/m with a 1.5 kg object on it. (*Make sure to use the spring-mass system equation—not the one for a pendulum.)*

14. A spring-mass system has a period of 0.15 seconds and a 150 g on it. What is the spring constant for the spring?

Remember again that the period is how long for 1 cycle OR T = #seconds/#cycles. The frequency is how many cycles occur each second OR f = #cycles/#seconds. Add these two formulas on the table in the first column.

15. A pendulum swings back and forth 14 times in 8 seconds. What is the pendulum's period?

And have these TAKS homeworks done: Conservation of Mass; Solutions; Properties of Water. You will have to show them to me and grade them by yourself before or after class.