A-Day Due Thurs., Jan 29
B-Day: Due Fri., Jan 30

2009 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: _____

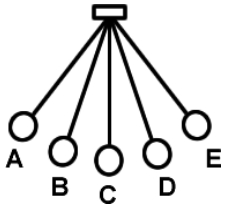
A spinning ball: _____

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.



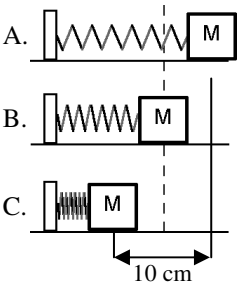
Where is the equilibrium position for this pendulum?

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?

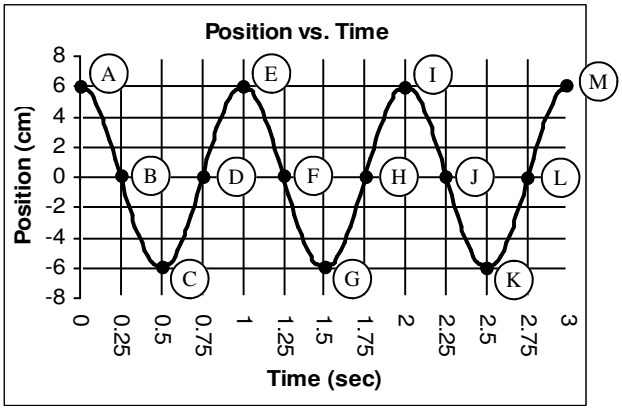
If the spring starts at position A, how much of a cycle does it complete from A to C?

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

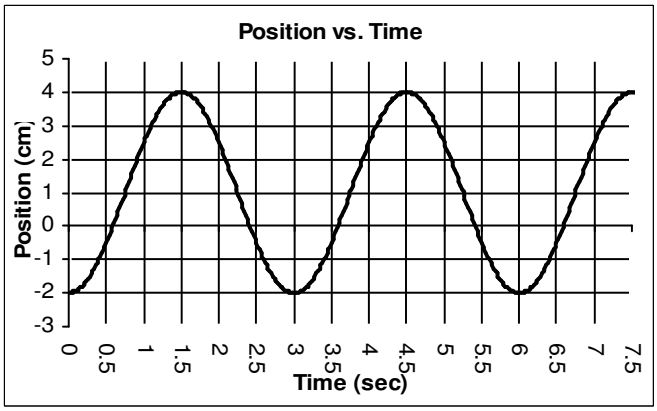
An spring has a period of 4 seconds. What is its frequency?

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) =

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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.

   Speed of a wave equation: $V = f\lambda$ *, where* λ *is the wavelength.*

3. If the frequency of a wave is 1.35 Hz, find its period.

4. If the frequency of a wave is 0.02 Hz, find its period.

5. If the frequency gets bigger, the period gets _____.

6. Find the period of a pendulum that is 80 inches long.

7. 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.)*

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