B-Day: Due Fri., Jan 26 (Assigned: 1/24)
A-Day: Due Mon., Jan 29 (Assigned: 1/25)

Harmonic Motion 4

1. *From the Harmonic Motion Spreadsheet (Excel).* Describe how the graph changed when you changed the following: Be clear with your descriptions. Drawing is permissible.

   A. When the equilibrium position becomes more positive:

   B. When the equilibrium position becomes more negative:

   C. When the period is increased:

   D. When the period is decreased:

   E. When the amplitude is increased:

   F. When the amplitude is decreased:

   G. When the phase is increased:

2. Use Graphs A-C at the right to answer the following:
   A._____Which graph has the biggest amplitude?
   B._____Which graph has the longest period?
   C._____Which graph has an equilibrium position of 0 cm?
   D._____Which graph has the highest frequency?
   E._____Which graph has the smallest amplitude?
   F._____Which graph has the lowest equilibrium position?
   G._____Which graph has the fastest period?
   H._____Which graph has the highest frequency?
   J. _____Which graph starts with a different phase from the others?
   K._____Which graph has the most energy?

   L. Find the period of Graph B.

   M. Find the amplitude of Graph C.

   N. Find the frequency of Graph A.

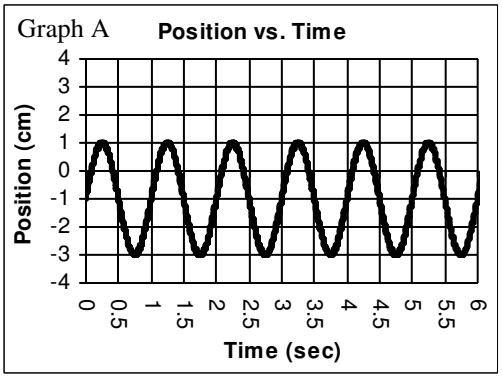
   O. Find the equilibrium position of Graph A.

   P. Mark 1 cycle on Graph B (trough to trough, please).

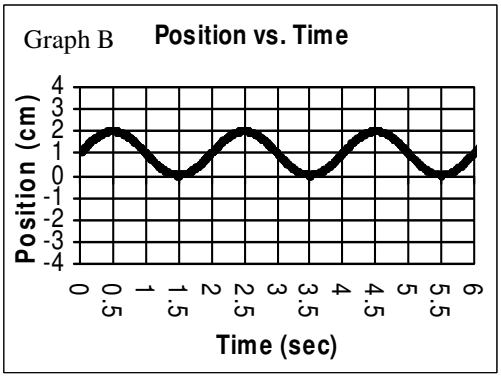
   Q. How many cycles does Graph A show?

   R. How long would it take the motion on Graph C to complete 12 cycles?

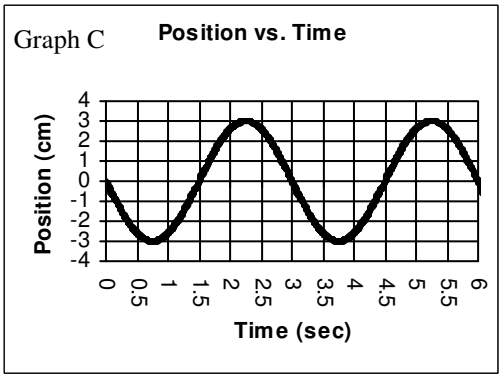
Graph A



Graph B



Graph C



3. When a spring has a bigger spring constant, is it easier or harder to stretch?

4. Positive, Negative, or Zero?
   A. ___ x: when you stretch a spring;
   B. ___ x: when you compress a spring;
   C. ___ F: when you stretch a spring;
   D. ___ F: when you compress a spring.
   E. ___ F: at the equilibrium position.
   F. ___ x: at the equilibrium position.

5. If the period of a pendulum is 1.2 seconds, find its length.

For this next part read your notes "Mass Spring Systems". It will tell you what "A" means, etc.

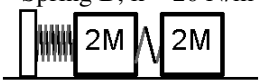
6. Maximum (Mx) or Minimum (Mn)?

A. ____ Ep at the endpoints.	E. ___ Ek at -A	I. ___ x at equilibrium	M. ___v at x = -A
B. ____ Ek at the endpoints.	F. ___ Ep at +A	J. ____ F at +A	N. ____a at x = 0
C. ____ Ek at equilibrium.	G. ___ Ek at x = 0.	K. ___ x at –A	O. ____a at x = -A
D. ____ Ep at x = 0.	H. ___ F at x = 0	L. ___ v at x = 0	P. ____a at x = A

7. Using the pendulums and springs at the right, answer the following:
   A. ____ Spring A or B has the biggest amplitude?
   B. ____ Pendulum A or B has the smallest amplitude?
   C. ____ Pendulum A or C has the quickest period?
   D. ____ Spring A or C has the quickest period?
   E. ____ Spring A or B has the quickest period?
   F. ____ Pendulum B or C has the highest frequency?
   G. ____ Spring A or C requires more force to compress it?
   H. ____ Spring B or C has the smallest amplitude?
   I. ____ Which pendulum has the most energy?
   J. ____ Spring A or B has the most energy?
   K. ____ Spring A or C has the most energy?

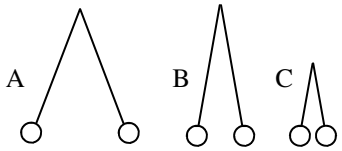
Spring A; k = 20 N/m

Spring B; k = 20 N/m



Spring C; k = 40 N/m

8. If M = 0.5 kg, find the period of Spring A.



9. A spring moves a total distance from side to side of 6 cm. Answer the following.
   A. How big is its amplitude?
   B. Where is its equilibrium position?
   C. How far does it travel in one complete cycle?

I'm not trying to be tricky here. Check the notes for what a "medium" is.

10. What's the medium that the waves travel through?
    A. Sound in a room:
    B. Waves in the ocean:
    C. The slinky in class:

11. What happens to a wave with no medium?

12. Can we hear sound in space?

13. Why or why not?