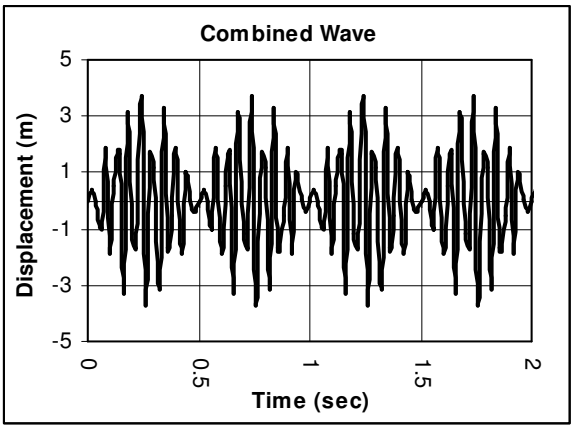
**A-Day: Due Thurs., Feb 21 (Assigned: 2/19)**
**B-Day: Due Fri., Feb 22 (Assigned: 2/20)**

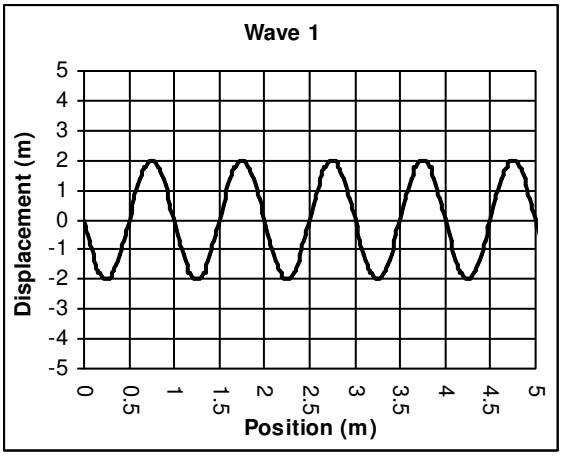
# 2008 Harmonic Motion 7

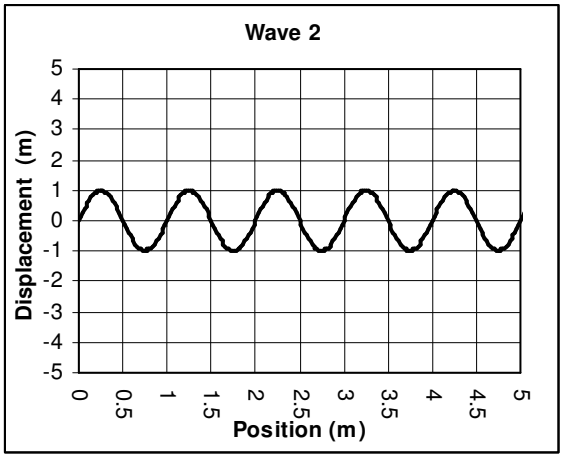

1. A fire truck and a police car are moving at the same speed.
   A. Who hears the fire truck's siren as a higher pitch than normal?
   B. Who hears the siren as lower pitch than normal?
   C. Who hears the siren as normal pitch (no change)?
   D. For which is the wavelength longer than normal?
   E. For which is the speed of sound fastest?
   F. What is this phenomenon called?




2. Use the graph at the right to answer the following.
   A. On the graph mark where it is loud and soft.
   B. How many beats PER SECOND are there?
   C. If frequency 1 is 830 Hz and frequency 2 is lower, what is frequency 2?
   D. If the two notes become more out-of-tune, will there be more or less beats per second?
   E. When the loud sections occur, is this constructive or destructive interference?

3. A trumpet and a clarinet can play the same note. How can we tell which instrument is which ? (*Use the word...*)




4. Use the above two graphs to answer the following questions.
   A. Are they in-phase or out-of-phase?
   B. If they occur in the same medium at the same time, will there be constructive or destructive interference?
   C. What will be the amplitude of the combined wave (*known as "superposition")?*
   D. What is the same between the two waves (two things)?

5. What is the period of a pendulum that is 65 cm long?

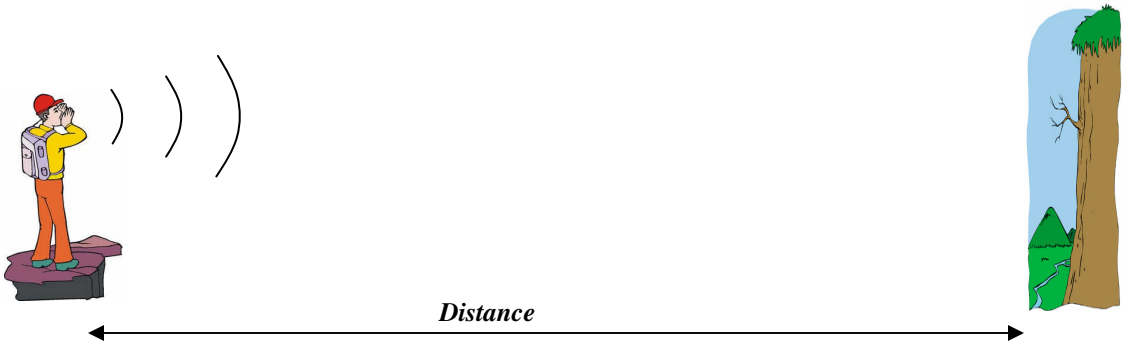
6. What is the frequency of a pendulum with a 1.3 second period?

7. A. If the period of harmonic motion gets bigger, the frequency gets:
   B. This means that period and frequency are inversely or directly proportional?

8. What has a longer wavelength: high notes or low notes?

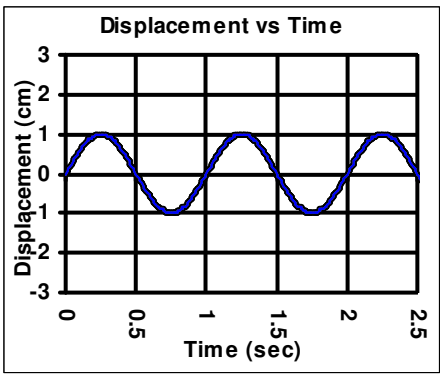
9. Which harmonic is 2 wavelengths long?

10. What is the wavelength of the fundamental harmonic on a string with a length of 0.8 meters.



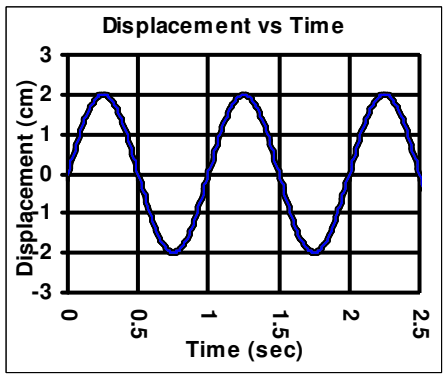

11. A person yells at a cliff. After 2.4 seconds, he hears the echo.
    A. How far does the sound travel? D or 2D?
    B. What is the speed of the sound?
    C. Find the distance TO THE CLIFF!

12. Decide which pendulum and spring belongs to each graph.



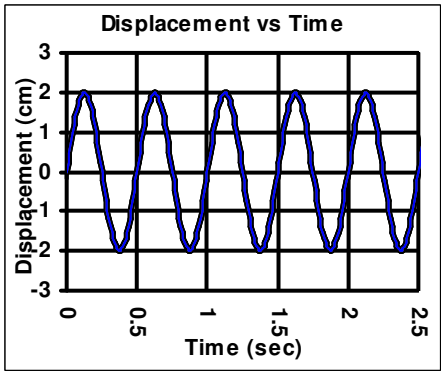

Pendulum _____

Spring _____




Pendulum _____

Spring _____




Pendulum _____

Spring _____