PreAP: Due: Tues., Feb 28 (Assigned: Fri., Feb 23)
HONORS ONLY

Harmonic Review 1

1. Use the standing wave diagram at the right to answer the following.
   A. Find its period B. What harmonic is this? ____

   C. Draw the wave form on the harmonic.
   D. What do we call the end that moves?
   E. What do we call the end that doesn't move?
   F. Find the natural frequency of this harmonic.
   G. Find the frequency of harmonic 3
   H. How many wavelengths long is this harmonic?
   I. If the entire harmonic is 2.5 meters long, find its wavelength.

   J. Using I and the frequency, find the speed of the wave.

680 Hz

   K. Can we hear the fundamental? _____

2. If a sound's natural frequency is 40 Hz find H_7. (How many nodes does H_7 have?____)

3. A low note for a bass (man) is a low A on the bass clef = 110 Hz. Find its wavelength.

4. A medium note for a soprano (woman) is a E at the top of the treble clef. Find its wavelength.

5. So, which has a longer wavelength? Low or high notes?

6. Which will create sounds of longer wavelength: birds or elephants?

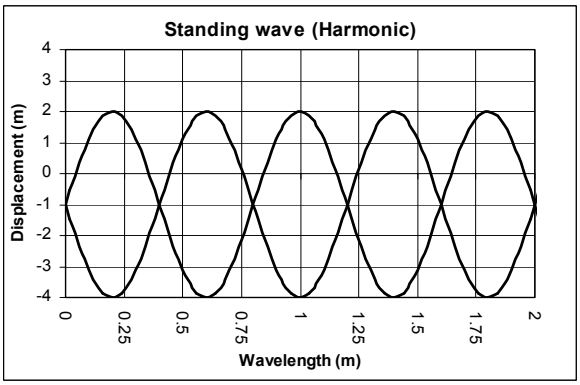
7. A wave moves forward and oscillates right to left. What kind of wave is it?

8. A 600 g object is put onto a spring which stretches 12 cm.
   A. Find its spring constant.

   B. Find its period.

9. Use the graph on the right to answer the following.
   A. Find its amplitude.
   B. Find the wavelength of the harmonic.

   C. What harmonic is shown? D. Mark a crest and trough.
   E. If it is a sound wave, find its frequency.



   F. Find the fundamental frequency for this space. (Find H_1)

   G. Using the frequency you found in E, find its period.

   H. Find the angular frequency of the graph. I. How long would it take for it to complete 6 cycles?

10. Given $a = -\pi^2\cos((\pi/3)t)$.
    A. Find the displacement equation. B. Find the velocity equation.

11. Given $x = 4\cos(\pi t)$

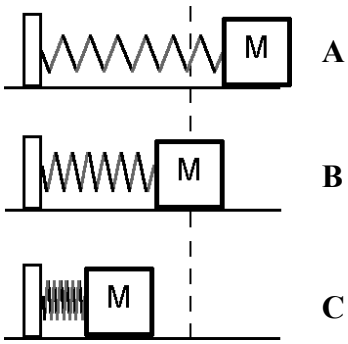
A. Give the amplitude. B. Give the period.

C. How far will it travel in one complete cycle (distance)?

D. If m = 250 g, find its spring constant.

D. Find the maximum displacement, velocity, and acceleration of the motion.

Oscillating Spring



12. Use the graphic at the right to answer the following.

A ____ Ek = max	D. ____ x = -A	G._____where it will stop
B. ____ v = 0	E. ____ a = 0	H._____F = 0
C. ____ F = +max	F. ____ Ep = 0	I. ____a = -max

13. High or low frequency?

A. ____ Bird	G._____Soprano (female)	M. ____ A flute
B. ____ Elephant	H._____Bass (male)	N. ____ Bass Guitar
C. ____ Tight string	I._____A flute with all hopes covered	O. ____ A tall pipe
D. ____ Loose string	J. _____A flute with all holes uncovered	P. ____ A short pipe
E._____ Wide pipe	K._____Blowing into a Half full bottle	
F._____ Skinny pipe	L. _____Blowing into a Empty bottle	

14. Absorption, Reflection, Refraction, or Diffraction?

If a wave hits a hard wall, it bounces off by:	Tile or marble makes for a loud room by:
If a wave hits a soft boundary, it dies by:	Eyeglasses magnify objects by:
A wave bends around a corner by:	Dark lines between your almost closed fingers by:
A wave bends inside a boundary by:	Light comes back from a mirror by:
Carpet can keep a room quiet by:	