PreAP: Due: Fri., Feb 24 (Assigned: Wed., Feb 22)
HONORS ONLY

Harmonic Motion 8
Honors Physics Only

1. Use the standing wave diagram at the right to answer the following.
   A. Find its period (f is below the harmonic).

   B. What harmonic is this? ____ C. Draw the wave form on the harmonic.
   D. Mark the nodes (N) and anti-nodes (AN).
   E. Find the fundamental frequency of this harmonic (H_1).
   (Also known as the n_____ f_____).

   F. Find the frequency of harmonic 2.

   G. Can we hear the fundamental? _____ H. How many wavelengths is the shown harmonic?

2. If a sound's natural frequency is 40 Hz find H_5. **240 Hz**

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

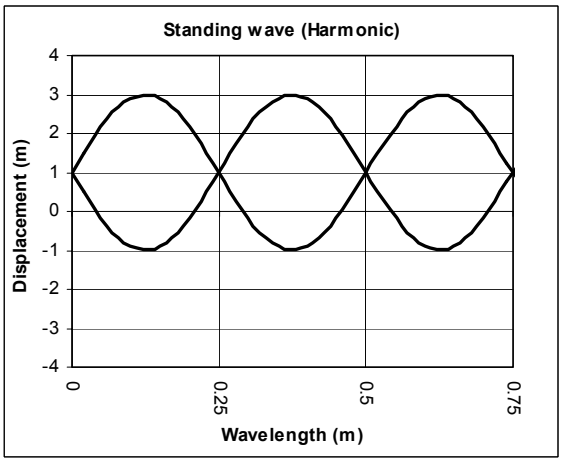
   C. What harmonic is shown?
   D. Draw the waveform on the graph.
   E. If it is a sound wave, find its frequency.

   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. Write the three wave equations (x, v, and a) for this graph (be sure to simplify).



4. Given these angular frequencies, give their periods: (try to do it first in your mind before using the equation or notes)

A.	_____ $= \pi$	C.	_____ $= \pi/2$	E.	_____ $= \pi/3$
B.	_____ $= 2\pi$	D.	_____ $= \pi/4$	F.	_____ $= 4\pi$

5. Given $v = -8\sin(\pi t)$.
   A. Find the displacement equation. B. Find the acceleration equation.

6. Given $x = 12\cos((\pi/2)t)$
   A. Give the amplitude. B. Give the period.
   C. How far will it travel in one complete cycle (distance)?
   D. Give the velocity equation. E. Give the acceleration equation.

   F. x_{max} = v_{max} = a_{max} =

7. A spring has motion given by: $x = 8\cos(\pi t)$
   A. When will it pass the equilibrium position?

   B. Find its velocity at the equilibrium position.

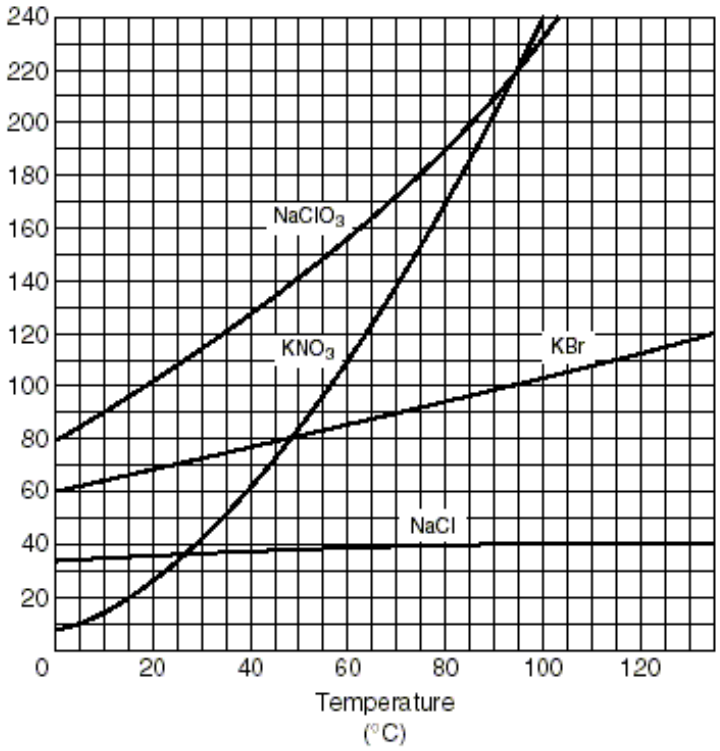
   C. Which direction is it going at t = 1.3 seconds?

   D. Since you can find the period from above, if it has a 3 kg mass on it, find its spring constant.

8. A 140 g mass is suspended on a spring. As a result it stretches 8 cm. Find the spring constant for this spring.

9. How much Potassium Bromide can 100g of H_2O hold at 90°C?

10. How much Sodium Chlorate can 250 g of H_2O hold at 40°C?



11. Unsaturated (U); Saturated (Sa); Supersaturated (SS)?
    A. ____ 60g of KBr at 80°C?
    B. ____ 180g of $NaClO_3$ at 60°C?
    C. ____ 90 g of KNO_3 at 70°C?
    D. ____ 40 g of table salt at 10°C?

12. Meiosis makes diploid or haploid cells?

13. Gametes are diploid or haploid?

14. A cell with 70 chromosomes undergoes mitosis, the daughter cells have how many chromosomes?

15. A cell undergoes meiosis and the daughter cells have 24 chromosomes. The parent cells had how many chromosomes?