PreAP: Due: Fri., Feb 17 (Assigned: Wed., Feb 15)
Reg: Due: Tues., Feb 21 (Assigned: Thurs., Feb 16)

Harmonic Motion 6

1. Amplitude (A) or Frequency (f)?

A. ____ Pitch
B. ____ Loudness
C. ____ Decibels
D. ____ Different musical notes
E. _____ Energy of sound
F. _____ A longer pipe changes this.

2. High or Low Frequency?

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

3. A wave's velocity is 90 m/sec with a frequency of 6 Hz. What is it's wavelength?

4. A sound wave has a wavelength of 20 m. Find its frequency.

5. If a sound wave's frequency is 100 Hz. What is its period?

6. What is the above wave's wavelength?

7. A railroad crew is repairing a rail. You hear the hammer 0.5 seconds after it is swung. How far away is the crew?

8. You hear a plane 4 seconds after you see it. Find the distance to the plane.

9. (*Choose correct answers*.) When a cell divides sexually through *Mitosis/meiosis* it produces a sex cell called a *gamete/ zygote*. The resulting cell will have *half/all* the chromosomes of the parent, therefore it is called a *haploid/diploid* cell.

10. A daughter cell has 14 chromosomes after it undergoes mitosis. How many chromosomes did the parent cell have?

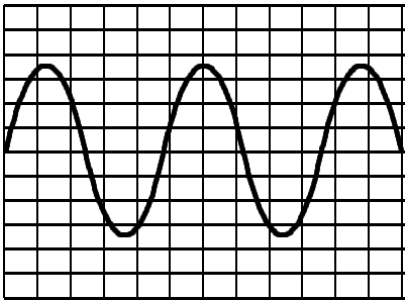
11. Twice as loud as 40 dB would be?
12. A wave oscillates left and right and the wave moves to the right. What kind of wave is it?

13. An object going the speed of sound is going Mach 1. If the space shuttle flies 7869 m/s, what Mach is that?

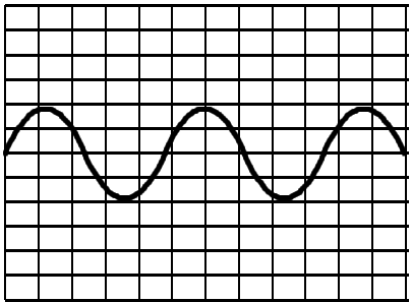
14. Sound travels faster or slower than in air at sea level.
A. ____ In helium B. _____ In steel C. _____ At the top of a mountain

15. A pendulum is 45 cm long and moves 24 cm from side-to-side.
A. Its amplitude is:
B. It travels how far in one period?
C. Where is the acceleration at a minimum?
D. Find its period.

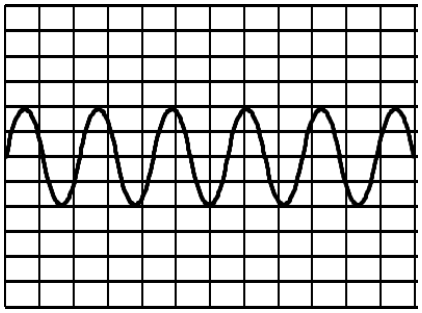
16. Find the spring constant of a spring that travels 10 cm side-to-side in 3 seconds with a 4 kg mass on it.



Graph 1



Graph 2

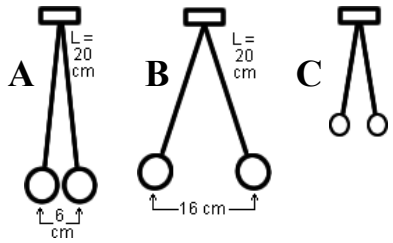


Graph 3

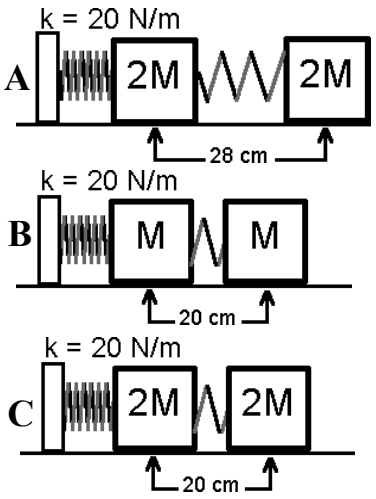
17. Choose from the above graphs: A. ____ A soprano; B. ____ A loud bass; C. ____ A quiet bass.

18. Choose between graphs 1 and 2: A. ____ 10 dB; B. ____ 20 dB.

19. Use the pendulums at the right and the graphs above to answer the following.
    - A. _____ Do Pendulums A and B have different periods?
    - B. _____ Do Pendulums A and B have different amplitudes?
    - C. _____ So Pendulums A and B must be which two graphs?
    - D. _____ Which graph is Pendulum A?
    - E. _____ Which two pendulums have the same amplitude?
    - F. _____ Which two graphs have the same amplitude?
    - G. _____ Which pendulum has the quickest period?
    - H. _____ Which graphs shows the quickest period?
    - I. _____ Which graph is Pendulum C?



20. Use the springs at the right and the graphs above to answer the following.
    - A. _____ Which two springs have the same amplitude?
    - B. _____ Which two graphs have the same amplitude?
    - C. _____ Which spring has the fastest period?
    - D. _____ Which springs have the same period?
    - E. _____ Which graphs have the same period?
    - F. _____ So which Graph is Spring B?
    - G. _____ Which Graph is graph 3?



1. Sound	A. Faster than the speed of sound.	1. Pitch	A. Where there is no sound because of its vacuum.
2. Sonic boom	B. A wave caused by alternating high and low pressure.	2. dB	B. How we hear changes of frequency of sound.
3. Supersonic	C. The organ that detects sound waves.	3. Space	C. 340 m/s in air.
4. Ultrasonic	D. A pressure wave caused by an object going faster than sound.	4. Loudness	D. How we measure loudness.
5. Cochlea	E. A sound higher than humans can hear.	5. v_s	E. The amplitude or strength of a sound.

21. Use the harmonic shown to answer the following.
    - A. _____Which harmonic is shown?
    - B. _____Mark the nodes and antinodes on the wave.
    - C. _____Which harmonic is the fundamental?
    - D. _____If this harmonic has a frequency is 60 Hz, find the frequency of the fundamental.
    - F. _____Can we hear this harmonic?
    - E. _____Find the frequency of the 3rd harmonic.