# Unit # 6-1 FRQ’s - AP Physics

## Problems

Complete on lined paper. Show all your work (including free-body diagrams if necessary). Box your final answers

1. How many beats per second are heard when two vibrating tuning forks having frequencies of 499 Hz and 506 Hz are held side by side?
2. A string of length 0.81m plays a note of frequency 450Hz when vibrating in its fundamental mode. What is the speed of the wave in the string?
3. The third harmonic of a complex tone has a frequency of 1400 Hz. What is the frequency of the fourth harmonic?
4. The frequency of the third harmonic of an closed pipe is 743 Hz. What is the length of the pipe if the speed of sound in air is 343 m/s.
5. If the speed of sound in air is 330m/s, what is the wavelength of a sound of frequency 700Hz?
6. An ambulance sounds its siren at 400Hz. If the ambulance moves away from you with a speed of 32m/s, what frequency do you hear if the speed of sound is 330m/s?
7. A wave has a speed of 60m/s and a wavelength of 13 meters. What is the period of the wave?
8. What length of open pipe is required to play a 375Hz note (in the fundamental mode of vibration) if the air temperature in the pipe is 23C?
9. An closed pipe is forced to resonate in its third harmonic and is measured to play a sound of 930Hz. What is the frequency of the fundamental harmon
10. If a guitar string has a fundamental frequency of 500 Hz, what is the frequency of its fourth harmonic