Music 170 Homework problem set 3 (due Oct. 13)

1. A mass-on-a-spring (the simplest kind, with one mass on one end of a spring that is anchored (fixed) at the other end) vibrates at 100 Hz. The spring is 10 cm long. How much shorter should we cut the spring to increase the frequency to 200 Hz.?

2. Suppose a stereo system at gain setting "11" puts out twice the amplitude it puts out at gain setting "10." How does the power compare? How many decibels more will come out?

3. A musical tone contains four partials, each at 50 decibels power level. What is the overall power level of the tone?

4. Light travels at $3 \cdot 10^8$ meters/second. A particular shade of red light has a wavelength of 700 nanometers ($7 \cdot 10^{-7}$ meters.) What is its frequency? Would a sound at this frequency be audible?

5. A 440- Hx. sinusoidal tone and another, different sinusoidal tone, beat together ten times per second. What are the possible frequencies of the second tone?