Homework #10 (on chapters 8, 9, and supplemental material).

1) Find the reverberation time at 500 Hz for a conference room that is 12 feet wide, 20 feet long, and 12 feet high. It has a carpeted floor, curtains on both of the long walls, plasterboard short sides, and a plasterboard ceiling. What will the reverberation time be if it is occupied by twenty people in upholstered seats?

2) Find the two lowest frequency modes of a shower stall that is 1 meter wide, 1.5 meters deep and 2.5 meters tall.

3) The problem of the Pythagorean musical scale is that 2^7 is not equal to $(3/2)^{12}$.
    a. How big is the interval between these numbers (measured in the unit of cents). Hints, first see what the ratio of these numbers is in the unit of semitones = $12*\log_2(\text{ratio})$. Then multiply your answer by 100 to get an answer in cents. Also note that $\log_2(x) = \log(x)/\log(2)$ where the log on the right hand side of the equation could be with respect to any base.

    b. Is this ratio something that the typical human ear can notice (think JND)?

4) What are the two main ingredients of linear instability?

5) What waveforms are typical for, a) linear instability, b) logical instability, and c) relaxation instability?