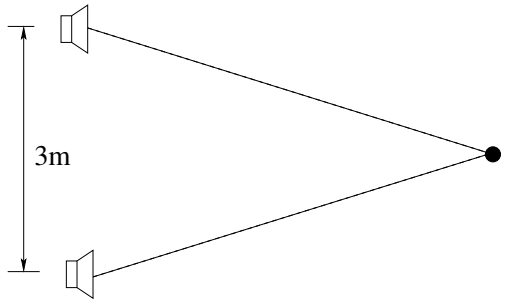
Problem Set #2

Due Monday, April 27 by 5pm to Dickinson 104

Note that all problems come from Physics and Music unless otherwise indicated.

1. Describe, in your own words, the following concepts and how they relate to the physics of sound:
    a. Destructive interference
    b. Constructive interference
    c. Beats
2. Two speakers separated by 3m in front of the room play the same single-frequency tone. If you stand on the midline between these two tones, you hear the same thing you would hear from a single speaker (see figure below). However, if you move off that midline, what you hear changes. Explain how the sound changes as you move off that midline and *why* it changes.



3. Three strings are sounded simultaneously: A_3=220 Hz, E_4=330 Hz, and E_5=660Hz. What are the frequencies of all the beat notes? (*Note: Make sure to consider **all** the beat combinations possible*)
4. The intensity level of a trumpet at a distance of 10 m is measured with a sound meter and found to be 78 dB. Find:
    a. Its sound intensity in W/m^2.
    b. The power of the source in watts.
    c. The sound level in decibels if you're only 5m away.
5. Seventy-six trombones are playing the same tune, each at a sound pressure level of 70 dB. What is the combined sound pressure level as compared with one trombone?