Sound Problem

1. You are watching a fireworks show when you notice there is a considerable delay between the flash of the fireworks and the sound of the explosion. You time this delay to be 4s. Assuming the speed of light is infinite, and the speed of sound in air is 343 m/s, how fat away from that blasts are you?

Decibel Problem

2. A jet engine taking off at a distance of 25 m has a sound intensity of 160 dB — enough to rupture your eardrums. At what distance will the jet engine sound be the much more pleasant 80 dB? Start by subtracting the two sound intensities.

Doppler Effect Problem

3. A car is blaring its horn as it approaches and eventually passes you. The car horn emits sound at a frequency of 500 Hz. The car is moving at a constant velocity of v = 40 km /h, and the speed of sound in air is 343 m/s. Calculate:
    a. The observed frequency as the car is approaching you.
    b. The observed frequency as the car passes you (the car is closest to you at this point).
    c. The observed frequency when the car is moving away from you.