Problem Set #4

Due Monday, May 18 by 5pm to Dickinson 104

1. Two trains on separate tracks move towards one another. Train 1 has a speed of 130 km/h and train 2 has a speed of 90 km/h. Train 2 blows its horn, emitting a frequency of 500 Hz.
    a. Without doing any calculation, will the frequency heard by an engineer on Train 1 be higher or lower than 500 Hz. Explain.
    b. Calculate the frequency heard by the engineer on Train 1.
2. Compare the advantages and disadvantages of *frets* on an instrument. How is playing a *guitar* (with frets) different than a *violin* (without frets) in terms of the notes you can play and the sounds you can represent?
3. Although a flute and a clarinet have about the same length, the fundamental pitch of the flute is about an active higher than then clarinet. Why?