

St. ID: _____ Name: _____

Chapter 17, Serway; *ANY TYPES OF CHEATING WILL MAKE YOU FAIL!*

Please write down the answers on the blank space or on the back of this paper. Answer should be in english. [] indicates the question points.

- Suppose a fire incident is happened near the “Zhi Xue” train station (Back gate of the school). Immediately a fire rescue car arrives and starts to rescue without turning off its siren. (a) If the sound level of its siren at the physics department is 100 dB from the siren, how much will be the sound intensity at the distance of 2 km from the siren? (b) In what distance the sound level will be zero? Let the distance between car and physics dept. is 3 km. [20+20]



- Now if the siren produce sound wave of frequency 1000 kHz (a) what will be the wavelength of the sound when a unsteady wind is blowing with velocity 32 m/s in opposite direction of sound? Let the sound velocity in steady air, $V_0 = 332$ m/s.
(b) If you are flying from Taipei to Hualien via “Zhi Xue” by a F/A-18 supersonic hornet aircraft of speed 1915 km/hr and let it move down for a moment at a negligible altitude towards the siren of car and then leave it to high altitude as shown in figure below. Find out the frequency of sound you heard before and after passing the siren of car? Consider it is possible to hear the sound from the aircraft. Use also $V_0 = 332$ m/s [20+40]



You may use the backside of the paper