NAME _____ DATE _____ CLASS _____

Section 13-1

HOLT PHYSICS

Concept Review

Sound Waves

1. In an experiment for measuring the speed of sound, a gun was shot 715 m away from the observer. It was heard 2.13 seconds after the flash was seen. What was the speed of sound in air at that time?

2. Sound travels at 1530 m/s in sea water. A signal sent down from a ship is reflected at the bottom of the ocean and returns 1.35 s later. Assuming the speed of sound was not affected by changes in the water, how deep was the ocean at that point?

3. A train at rest blows a whistle to alert passengers that it is about to depart from a subway station. The pitch of this whistle is 1.14×10^4 Hz. The speed of sound in the air in that subway tunnel is 342 m/s. The speed of sound in iron is 5130 m/s.

a. What is the wavelength of that sound in the air?

b. What is the distance between consecutive areas of compression and of rarefaction in the spherical sound waves spreading from the whistle in the air?

c. Assuming that the sound was loud enough to be heard from the end of the 1200 m long tunnel, when was it heard through air? through the rails?

d. What was the apparent frequency of the sound waves that reached the end of the tunnel?

e. As the train left the station, did the frequency appear to change for a listener on the platform? inside the train? at the other end of the tunnel?