Physics: Sound Quiz Review Name:

Directions: Please follow the criteria for credit.

Objective 1: Write and apply the formula to determine the speed of sound. **Objective 2:** Describe possible standing sound waves in a pipe that has either open or closed ends, and determine the wavelength and frequency of such standing waves

1. If A is 440hz, find the frequency of F# in third octave above.

hz

b) If the air temperature is 20C, what is the wavelength of the note E(same octave) in the above problem?

_____m

2. If A is 440hz and you want to play a C# in the second octave above on a 2.4cm diameter closed pipe in a 13°C room, How long should the pipe be?

_____m

3. An open organ pipe is 4.23m long and has a diameter of 30cm. What is its 1st harmonic and the next two? The air is 29°C.

_____hz

_____hz

_____hz

4. A boat is drifting directly over a whale on a foggy 30°C day. If a different boat that is 3.5km away backfires, how much time elapses between the instant the squid hears the sound to when the people on the boat hear it? (Vsound in water is 1500m/s)

_____S

5. A person shoots a gun on a 25 C day. Another person hears the shot after 5 s elapse. How far apart are the two people?

6. A satellite dish falls off of a 80m tall building. If the air temperature is 12C, How long will it take until a pigeon on top of the building hears the crash of the dish on the pavement below?

_____ S

7. A soldier is standing in a canyon. He shoots his gun and hears an echo off of one wall in 3 s. He hears the echo off of the other wall 6 s after the first echo. How wide is the canyon? The temperature is 6C.

_____m

8. A boat backfires on the ocean. The sound towards a seawall 4000m away. What is the difference in time between sounds hear by an observer on the boat and a scuba diver under water directly beneath the boat? Air temp is 15C (Vsound in water is 1500m/s)

_____ S