name_____

ID# _____

Experiment 9

Standing Waves and the Speed of Sound

Air temperature _____

Accepted speed of sound _____

tuning fork frequency		
node number	**node position**	**difference in positions**

Average difference in positions _____

Average wavelength_____

Experimental speed of sound _____

% error _____

Show equations and sample calculations:

tuning fork frequency		
node number	**position of node**	**difference in positions**

Average difference in positions = _____

Average wavelength = _____

Experimental speed of sound = _____

% error = _____

% error = _____

(8 points)

If you apply a force to an object at the same rate as its natural frequency it will vibrate with a large amplitude. This is called resonance. This is why the windows sometimes rattle when a jet flies by. Think of some other examples of where resonance could be very destructive.

Questions

1. If you stand at the sink and fill a gallon jug with water you can hear the sound of the rushing water reflected from the surface of the water in the container. The sound the water makes is a mixture of many frequencies. What happens to the frequency of the reflected sound as the jug fills? What causes this effect? (Hint: Look at the positions of the first nodes for the different tuning forks.) **(4 points)**

2. Explain why the pipes on an organ different sizes for each note. **(4 points)**

3. A violin produces notes of higher frequencies, than a cello, even though the two instruments are the same sort of shape. Why is that? **(4 points)**