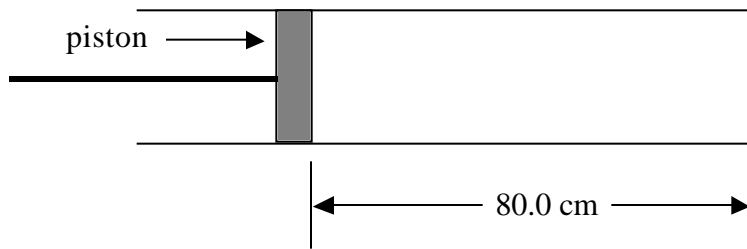


Name _____

Date _____ Pd _____

Waves Unit III, Worksheet 2

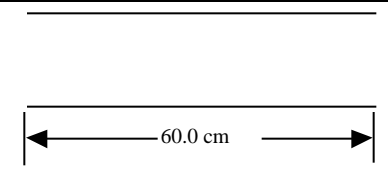
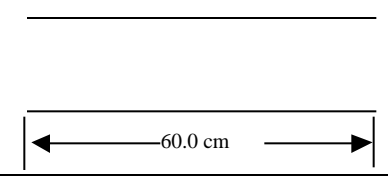
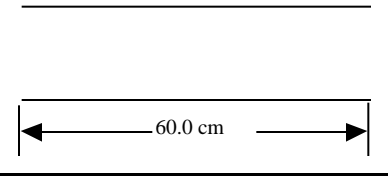
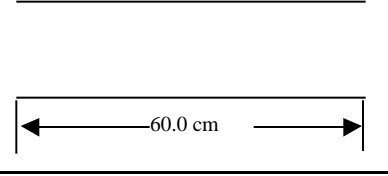
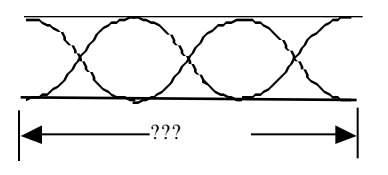
1. A tube has a piston located as shown in the diagram.



- a. Sketch the indicated mode of vibration for this setup
- b. Determine the unknown value in each box
- c. Place the name of each mode in the frequency box

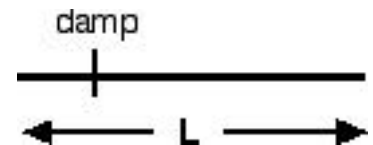
MODE	DIAGRAM	WAVELENGTH	FREQUENCY	WAVE SPEED
1 st				340. m/s
2 nd				340. m/s
3 rd				340. m/s
4 th				340. m/s
??		92.0 cm	388 Hz	

2. This time fill in the chart for a tube open on both ends.
- Sketch the indicated mode of vibration for this setup
 - Determine the unknown value in each box
 - Place the name of each mode in the frequency box

MODE	DIAGRAM	WAVELENGTH	FREQUENCY	WAVE SPEED
1 st				340. m/s
2 nd				340. m/s
3 rd				340. m/s
4 th				340. m/s
??		134 cm	256 Hz	

3. Patty Melt is holding a tuning fork over a tube that has been inserted into a container of water. The first resonance is at 45.2 cm, and the speed of sound in air that day is 345 m/s.
- What is the frequency of the fork?
 - She then raises the tube until she gets a second resonance. How much of the tube is now out of the water?

4. A long metal bar of length L is held by a clamp $L/4$ from the end, as shown in the diagram. The bar is struck and rings with a certain frequency.



- How does the wavelength of the fundamental compare to the length of the bar? Use a diagram to explain your answer.

- The clamp is now moved to the middle of the bar. Will the frequency of the new fundamental be higher, lower or the same as before? Explain.

- Predict what would happen if the bar were clamped $L/3$ from the end. Will a standing wave pattern be generated. Why or why not?