

**Mixed Review** *continued*

3. A 330 Hz tuning fork is vibrating after being struck. It is placed on a table near but not directly touching other objects, including other tuning forks. Eventually one glass and one other tuning fork start vibrating. Explain why this happens.

---

---

---

---

4. The first harmonic in a pipe closed at one end is 487 Hz.

- a. Find the next two harmonic frequencies that will occur in this pipe.

---

- b. What are the corresponding wavelengths of the first three harmonics?  
(Hint: assume the speed of sound is 345 m/s.)

---

- c. What is the length of this pipe?

---

- d. Repeat this exercise for a pipe open at both ends.

---

---

---

---

---

5. A piano tuner uses a 440 Hz tuning fork to tune a string that is currently vibrating at 445 Hz.

- a. How many beats per second does he hear?

---

- b. What other frequency could produce the same sound effect? Explain why.

---