

Chapter 34 Standing Waves (Examples) (S18)

Example 1: A string fixed at both ends has a linear density of 1 gm/m and a length of 2 m . What tension will result in a second harmonic of 480 Hz ?

Example 2: A 1.5 m long piece of string is fixed at both ends. A physics student forces the string to vibrate while holding the string's mid point stationary. The tension in the string is 160 N and the string has a mass of 25 gm . What is the lowest frequency that will be heard?

Example 3: What is the fundamental frequency of a 2 m long pipe that is open at both ends?

Example 4: An open pipe has a second overtone frequency of 1200 Hz . What is the fundamental frequency of a closed pipe with the same length as the open pipe?

Example 5: A 16 cm long tube closed at one end is filled with an unknown gas. If the tube has a fundamental frequency of 760 Hz , what is the speed of sound in the gas?

Example 6: Two identical 1.5 m long strings have a fundamental frequency of 440 Hz . If the tension in one is reduced to 95% of the other, what is the beat frequency?