

Examples: Sound

1. Assuming an ambient temperature of 20°C . Determine the wavelength for the sound waves at the following frequencies
 - a) 200Hz
 - b) 500Hz
 - c) 16 KHz
2. How would the wavelengths change for the examples above if the temperature decreases?
3. Sketch and find the first resonant length of a glass tube (assuming an ambient temperature of 20°C) and a frequency of 50Hz, if it's
 - a) Open at one end
 - b) Open at both ends
 - c) Closed at both ends
4. You wish to use a 1.0m length of PVC piping as a resonator for an experiment. Assuming an ambient temperature of 20°C
 - a) Calculate the first resonant frequency if you leave the pipe open at one end
 - b) Calculate the first resonant frequency if you leave the pipe open at both ends
 - c) What would be the frequency of the next harmonic to resonate in a)?
 - d) What would be the frequency of the next harmonic to resonate in b)?
5. Determine the sound intensity (both in W/m^2 and dB) of a 100W amplifier at a distance of
 - a) 1.0m
 - b) 2.0m
 - c) 10m
 - d) 100m
6. Determine the effect on frequency if
 - a) the length is doubled

- b) the tension is quadrupled
- c) The diameter is cut in half
- d) If the density is reduced by a quarter
- e) if the density is doubled and the tension is tripled