

1. A string of length 3λ fixed at both ends vibrates in its third harmonic at 50 Hz . The string has a mass of 3 g . **a)** What is the speed of waves on the string? **b)** What is the tension for the string?

2. A traveling wave has the form $y(x,t) = 0.002\lambda \sin(\pi \text{ rad/m } x + 50\pi \text{ rad/s } t)$. Give values for the amplitude, wavelength, frequency, period, direction of propagation, and wavespeed.

3. The speed of sound in air is 340 m/s . A car with a 620 Hz horn is traveling toward an observer at 30 m/s . What frequency does the observer hear?

4. The decibel measure of sound intensity is referenced to $I_0 = 10^{-12} \text{ W/m}^2$. What is the decibel rating of a sound wave with intensity $4.0 \mu\text{W/m}^2$?

Find the ratio of the amplitudes of 1.25 Hz sound waves with intensities $4.0 \mu\text{W/m}^2$ and 10^{-12} W/m^2