

Wave Speed, Frequency, & Wavelength Practice Problems

| | |
|----------------|---------------------------------|
| $v = f\lambda$ | $c = 300,000,000\text{m/s}$ |
| $c = f\lambda$ | $(c = 3 \times 10^8\text{m/s})$ |

Use the above formulas and information to help you solve the following problems. Show all work, and use the factor-label method to perform all necessary conversions.

1. Sound waves in air travel at approximately 330m/s. Calculate the frequency of a 2.5m-long sound wave.

$$f = 132\text{Hz}$$

2. A wave on a certain guitar string travels at a speed of 200m/s. Calculate the wavelength of an "A" note sounding at 440Hz.

$$\lambda = 0.45\text{m}$$

3. A low-frequency radio wave has a frequency of 250,000Hz. What is the wavelength of this radio wave? (Hint: Don't forget that this is an electromagnetic wave, and therefore you should automatically know its speed.)

$$\lambda = 1200\text{m}$$

4. A certain microwave has a wavelength of 0.032 meters. Calculate the frequency of this microwave.

$$f = 9.375 \times 10^9\text{Hz}$$