

2005 Wavelength Problems

[LINK](#) to metric conversions

1. Sound waves in air travel at approximately 330.m/s.

Calculate the frequency of a 1.75m-long sound wave.

2. A wave on a certain guitar string travels at a speed of 200.m/s.

a. Calculate the wavelength of an "E" bass string sounding at 41.0Hz.

b. Calculate the wavelength of an "B" bass string sounding at 31.0Hz.

3. A certain microwave has a wavelength of 64.0mm.

Calculate the frequency of this microwave.

4. A certain radio wave has a wavelength of 3.00 feet.

a. Convert the wavelength of this radio wave into meters. (1 meter = 39.37 inches)

b. Find the frequency of this radio wave.

5. A certain wave on the border between microwaves and infrared waves has a frequency of 2.372 Tera Hz.

a. Calculate the wavelength of this wave in meters.

b. Convert the wavelength from part A into millimeters.

6. Sound waves in air travel at approximately 330.m/s.

Calculate the frequency of a 2.50m-long sound wave.

7. A wave on a certain guitar string travels at a speed of 200.m/s.

Calculate the wavelength of an "A" note sounding at 440.Hz.

8. A low-frequency radio wave has a frequency of 250.kHz.

What is the wavelength of this radio wave?

9. A certain microwave has a wavelength of 32.0mm.

Calculate the frequency of this microwave.

10. A certain radio wave has a wavelength of 7.00 inches.

- a. Convert the wavelength of this radio wave into meters. (1 meter = 39.37 inches)
- b. Find the frequency of this radio wave.

11. A certain wave on the border between microwaves and infrared waves has a frequency of 2.00 Tera Hz.

- a. Calculate the wavelength of this wave in meters.
- b. Convert the wavelength from part A into millimeters. (1 meter = 1000 millimeters)

12. The wavelengths of visible light range from approximately 400 nanometers to 750 nanometers.

- a. Convert the 750.nm wavelength of the red light into meters.
- b. Convert the 400.nm wavelength of the violet light into meters.
- c. Now find the frequency of the **higher-frequency** colored light of parts A and B. (Hint: Before calculating, give some thought to the relationship between frequency and wavelength. Then you only need to calculate for the one color that corresponds to the higher frequency.)

13. You are standing on a dock and notice that it takes 2.50 seconds for the crest of two successive waves 3.00 meters apart to pass beneath you.

- a. What is the frequency?
- b. What is the period?
- c. What is the wave speed?