1. A wave with a frequency of 60.0 Hz travels through vulcanized rubber with a wavelength of 0.90 m. What is the speed of this wave?

$$v = f\lambda = (60.0\ \text{Hz})(0.90\ \text{m}) = 54\ \text{m/s}$$

2. A wave with a frequency of 60.0 Hz travels through steel with a wavelength of 85.5 m. What is the speed of this wave?

$$v = f\lambda = (60.0\ \text{Hz})(85.5\ \text{m}) = 5130\ \text{m/s}$$

3. The lowest pitch that the average human can hear has a frequency of 20.0 Hz. If sound with this frequency travels through air with a speed of 331 m/s, what is its wavelength?

$$\lambda = \frac{v}{f} = \frac{331\ \text{m/s}}{20.0\ \text{Hz}} = 16.6\ \text{m}$$

4. One of the largest organ pipes in the world produces a sound with a wavelength of about 10.6 m. If the speed of sound in the air is 346 m/s, what is the frequency of this sound?

$$f = \frac{v}{\lambda} = \frac{346\ \text{m/s}}{10.6\ \text{m}} = 32.6\ \text{Hz}$$

5. If a bass note with a frequency of 30.0 Hz travels from a speaker at a speed of 329 m/s, what is the wavelength of this sound wave?

$$\lambda = \frac{v}{f} = \frac{329\ \text{m/s}}{30.0\ \text{Hz}} = 11.0\ \text{m}$$

6. If a different note in the same music travels from the speaker at 329 m/s and has a wavelength of 0.05 m, what is the frequency of this sound wave?

$$f = \frac{v}{\lambda} = \frac{329\ \text{m/s}}{0.05\ \text{m}} = 6580\ \text{Hz}$$

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