

Class work 6-6

1. A piano emits frequencies that range from a low of about 28 Hz to a high of about 4200 Hz. Find the range of wavelengths in air attained by this instrument when the speed of sound in air is 340 m/s .
2. The speed of all electromagnetic waves in space is $3.0 \times 10^8 \text{ m/s}$. Calculate the wavelength of electromagnetic waves emitted at the following frequencies
 - a. radio waves at 88.0 MHz ($88.0 \times 10^6 \text{ Hz}$)
 - b. visible light at $6.0 \times 10^8 \text{ MHz}$ ($6.0 \times 10^{14} \text{ Hz}$)
 - ~~c.~~ c. X rays at $3.0 \times 10^{12} \text{ MHz}$ ($3.0 \times 10^{18} \text{ Hz}$)

Speed of wave = wavelength \times frequency

$$v = \lambda f$$

Unit for frequency is Hertz (Hz)

$$1 \text{ Mega Hertz (1 MHz)} = 10^6 \text{ Hz}$$