

30. (a) From Eq. 17-53, we have

$$f = \frac{nv}{2L} = \frac{(1)(250 \text{ m/s})}{2(0.150 \text{ m})} = 833 \text{ Hz} .$$

(b) The frequency of the wave on the string is the same as the frequency of the sound wave it produces during its vibration. Consequently, the wavelength in air is

$$\lambda = \frac{v_{\text{sound}}}{f} = \frac{348 \text{ m/s}}{833 \text{ Hz}} = 0.418 \text{ m} .$$