1. Explain how the wave speed and the maximum (transverse) speed of a particle in the string are different.

2. Light of wavelength 560.0 nm is combined with light of another wavelength in air. The superposition of the two beams gives beats with a frequency of 8.000 THz. What is the wavelength of the second beam? There are two possible values. (T means tera, a prefix indicating some power of 10.)
3. A sinusoidal traveling wave is established in a string. The amplitude of the wave is 0.120 cm, the string is under 150 N tension, the wave speed is 180 m/s, and the wavelength is 2.50 m.

(a) Write a function for this wave.

\[ y(x,t) = \]

(b) Rewrite the average power equation to eliminate the wavespeed.

\[ P_{avg} = \frac{1}{2} \mu v^2 y_m^2 \]

(c) Calculate the average power carried by the wave.

(d) I now replace the string with a different string that has \textbf{twice the mass} (but the same length), and leave it connected to the same source and keep \textbf{all other} quantities the \textbf{same}. What happens to each of the quantities below? (Your answers should be like the following: Increases by 4 x, Stays the same, Decreases by a factor of 2 squared, etc.)

(i) wave speed,

(ii) frequency,

(iii) wavelength,

(iv) average power.