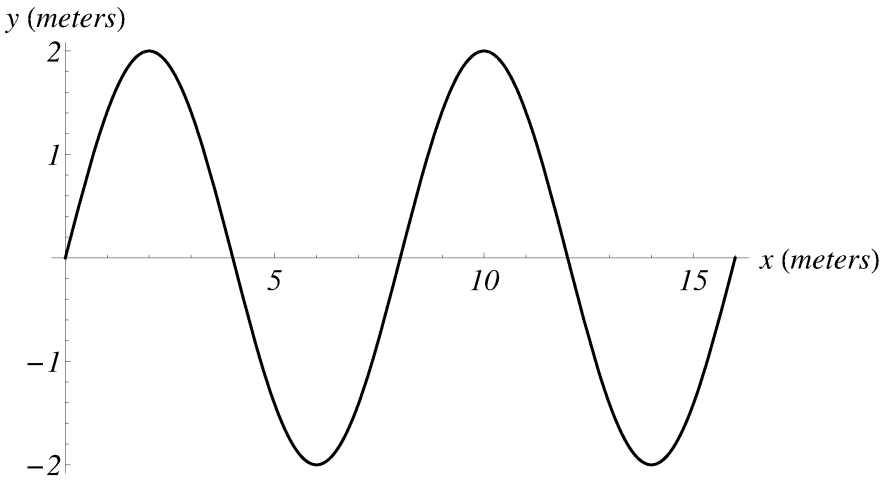
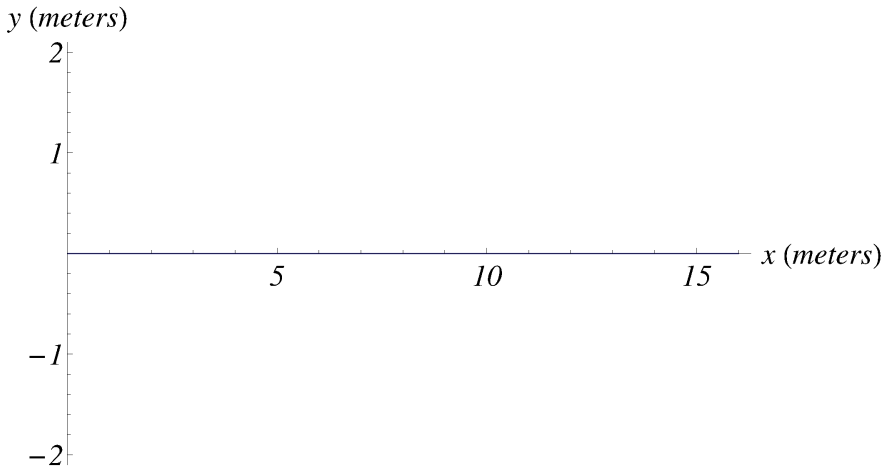
Prelab 4:
Transverse Standing Waves

PHYS 1320
Fall 2016
Due at the beginning of class.

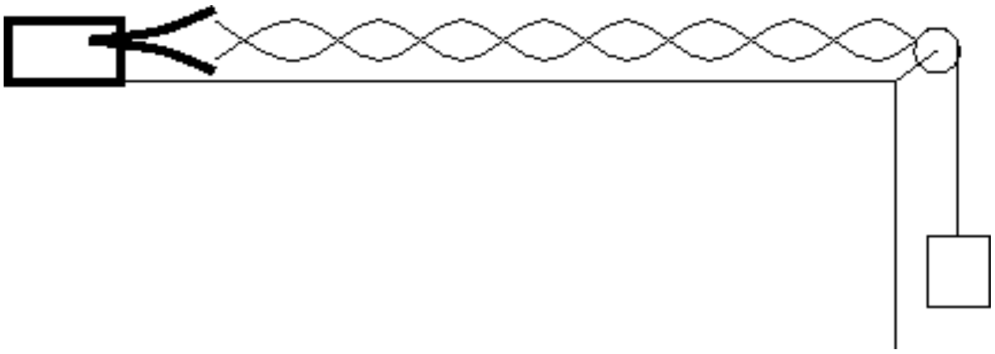
1) The diagram below shows a snapshot of a vibrating string taken at time $t = 0$ seconds.



- What is the wavelength?
- What is the Amplitude?
- If T is the period of oscillation, sketch a snapshot of the wave one half period later, at $t = T/2$.



The next experiment consists of a tuning fork mounted to the lab bench, which vibrates a horizontal string that can be draped over a pulley and loaded with mass as in the figure below.



The equation describing standing waves in a string under tension is,

$$f = \frac{1}{\lambda}\sqrt{\frac{T}{\mu}}$$

where f is the linear frequency of oscillation, λ is the wavelength of the vibrations, T is the tension in the string, and μ is the linear mass density of the string—that is the mass per unit length. Explain in detail how you would determine (using tools in the lab, and without using the formula):

- the wavelength of the vibrations

- the tension in the string

- the linear mass density of the string