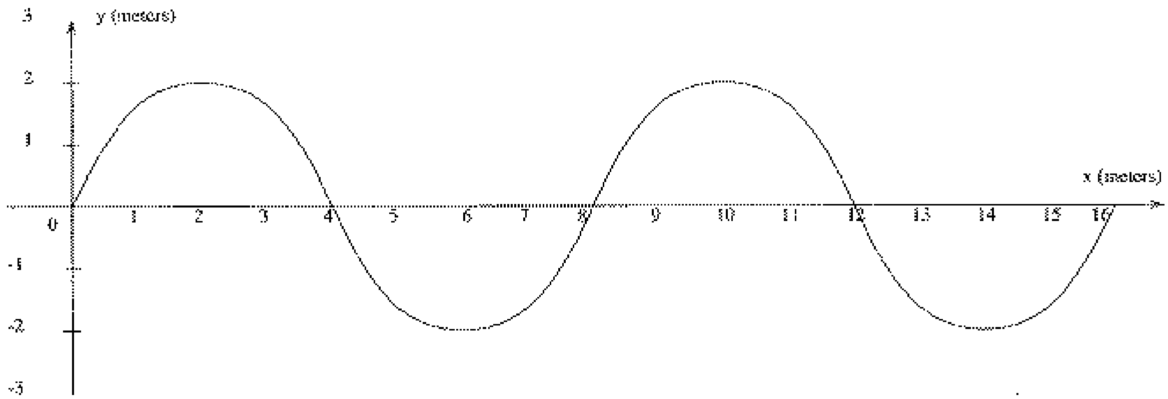
Standing Waves Prelab Assignment

Name:______________________________ ID Number:______________________________

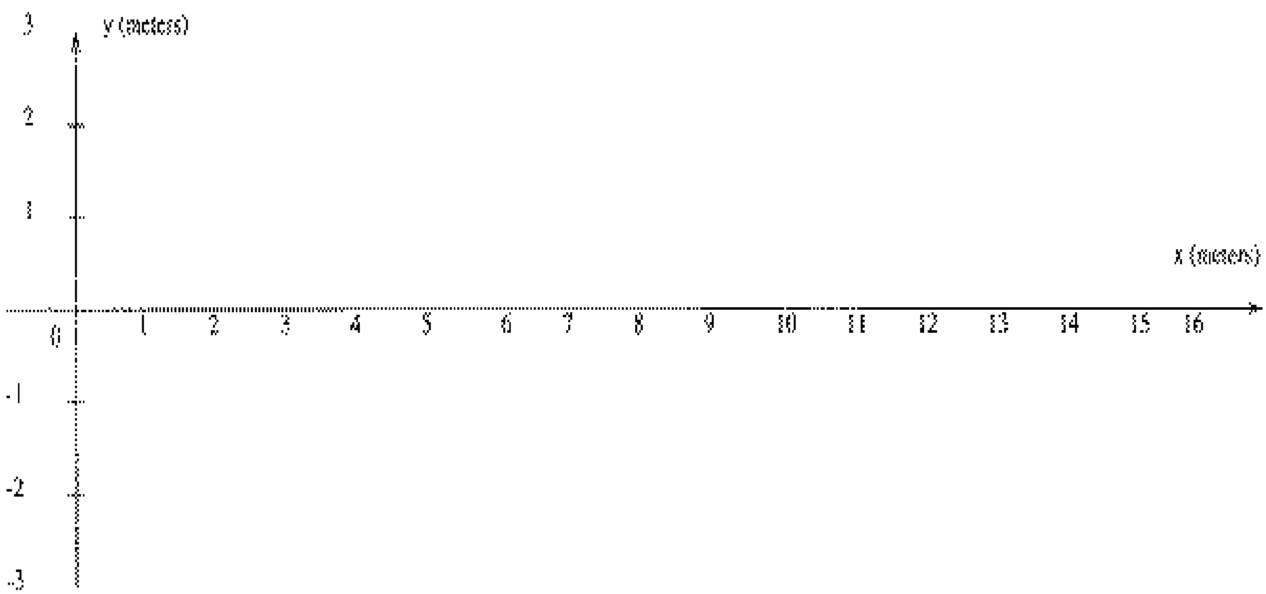
1. The diagram below shows a snapshot of a vibrating string taken at time t=0 seconds.



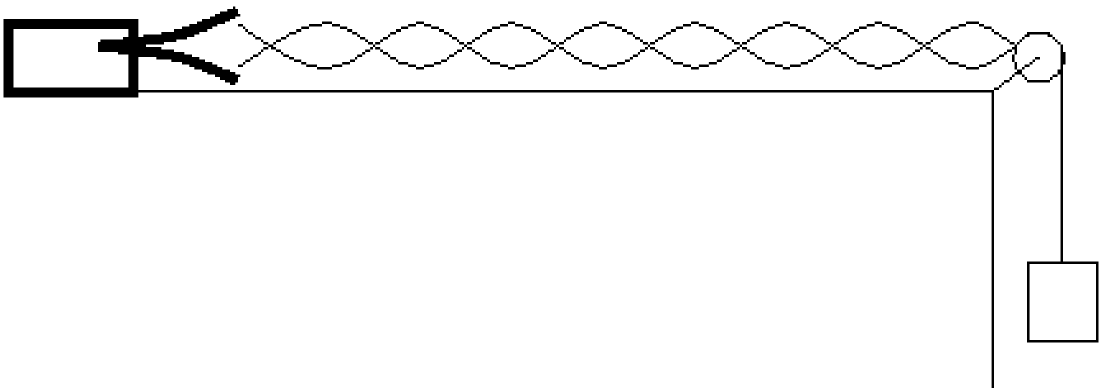
1. What is the wavelength?

2. What is the amplitude?

3. If T is the period of oscillation, sketch a snapshot of the wave one half period later, at t=T/2.



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.



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. Explain in detail how you would determine (using tools in the lab, and without using the formula):

1. the wavelength of the vibrations

2. the tension in the string

3. the linear mass density of the string