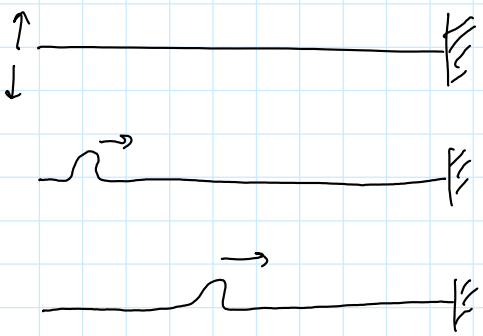
Phy 4C 2/3

Friday, February 3, 2017 12:02 PM

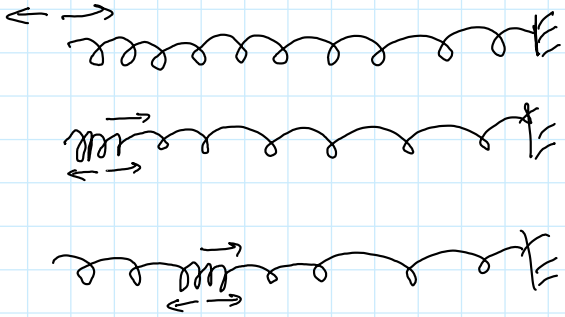
Start ch 16

Mechanical waves

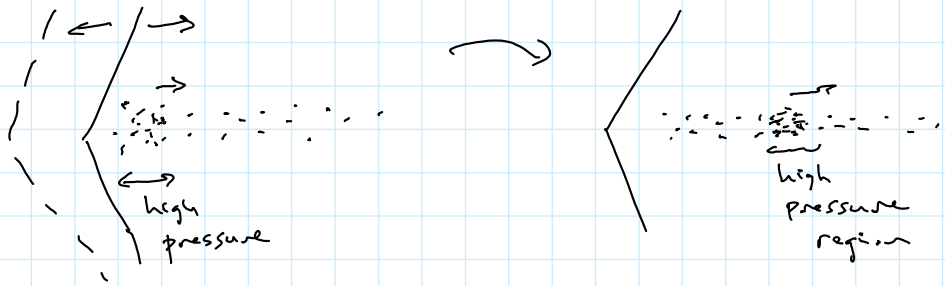
Transverse wave



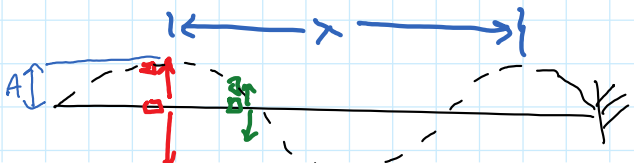
Longitudinal wave

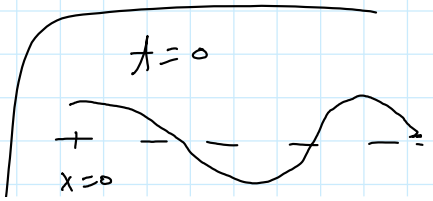


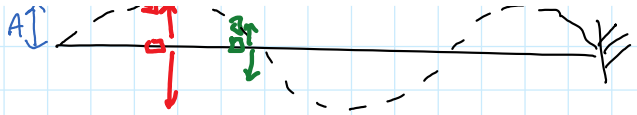
Speaker

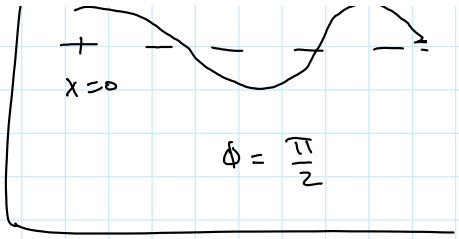


Wave function: wave on a string









$$y = A \sin(kx - \omega t + \phi)$$

A = Amplitude (max. displacement)

k = angular wave Number = $\frac{2\pi}{\lambda}$

λ = wavelength

f = frequency $\left(\frac{\text{cycles}}{\text{sec}}\right) = \frac{1}{T}$

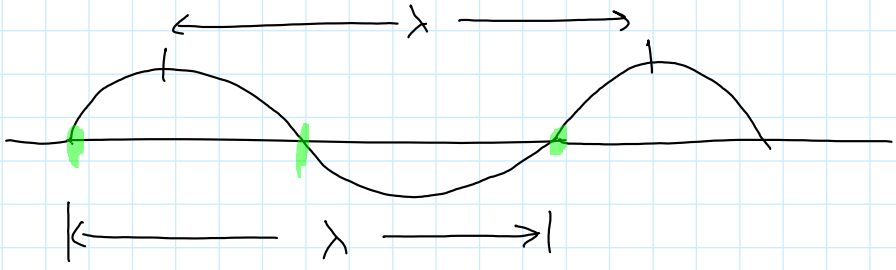
T = period $\left(\frac{\text{sec}}{\text{cycle}}\right) = \frac{1}{f}$

ω = angular frequency = $2\pi f$

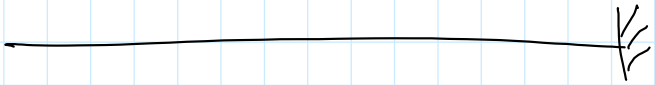
ϕ = phase angle (is used to match the initial conditions)

velocity: $\boxed{v = \lambda f}$ true for any wave

wavelength:



Strings:

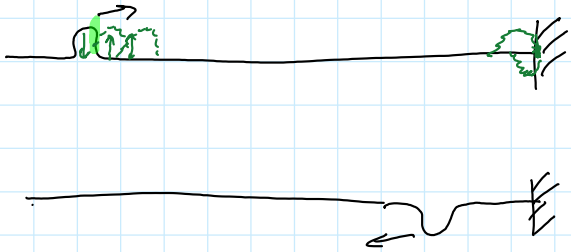


speed depends on: density
tension

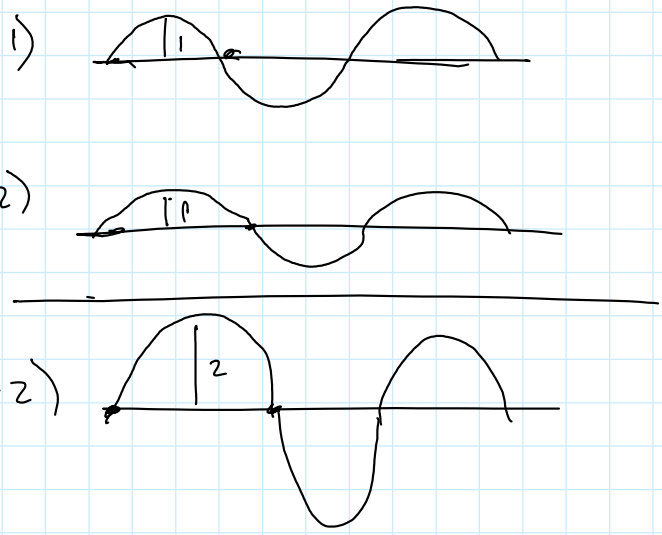
$$v = \sqrt{\frac{T}{\mu}}$$

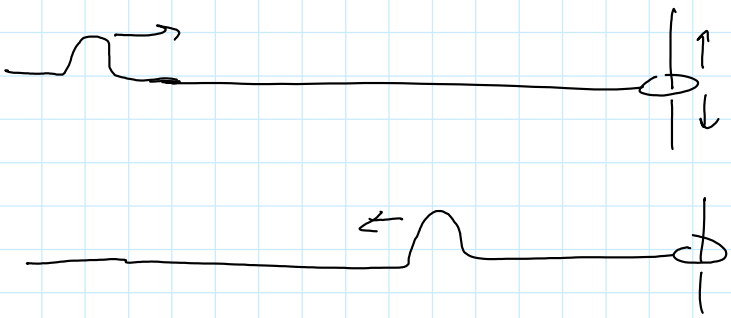
↖ mass density of string

Reflection



fixed end





end of string can move up and down

Transmission:

Transmission: