The Harmonic Waveform (in 1-D)

$$y(x,t) = A\cos\left(\frac{2\pi}{\lambda}(x - vt)\right) \equiv A\cos(kx - 2\pi ft) \equiv A\cos(kx - \omega t)$$

y is the displacement from equilibrium.

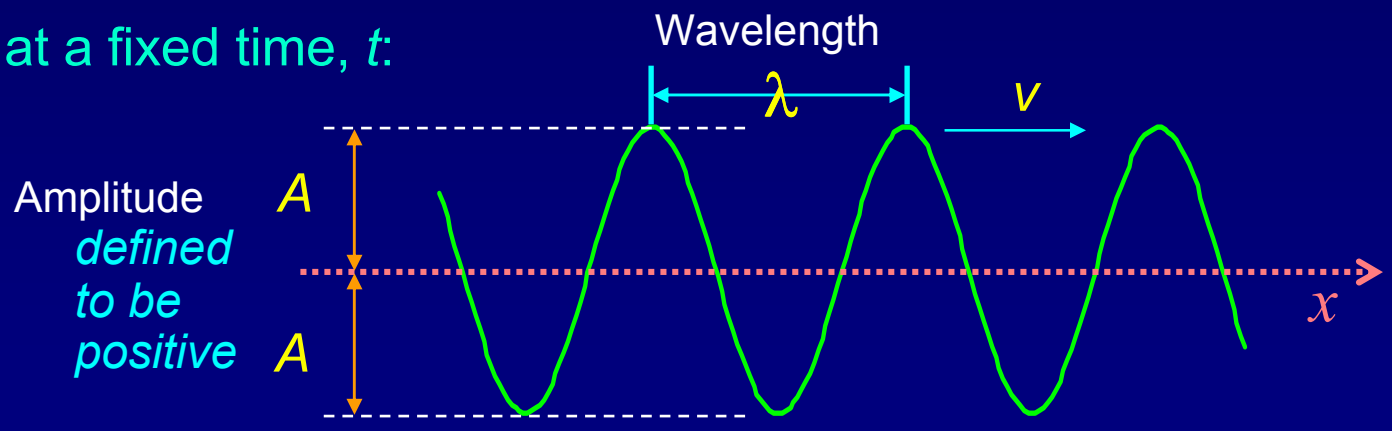
$v \equiv$ speed $A \equiv$ amplitude (defined to be positive)

$\lambda \equiv$ wavelength $k \equiv \frac{2\pi}{\lambda} \equiv$ wavenumber

$f \equiv$ frequency $\omega \equiv 2\pi f \equiv$ angular frequency

A function of two variables: x and t.

A snapshot of y(x) at a fixed time, t:



This is review from Physics 211/212.
For more detail see Lectures 26 and 27 on the 211 website.