Reading 1/10 Solutions

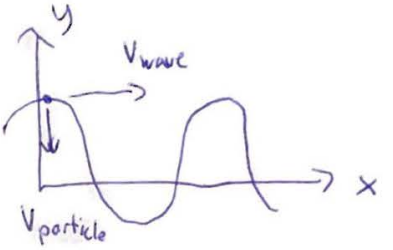
① (a) Since the graph disturbance axis (y) is labeled "y" and the direction axis is labeled "x", this is most likely a transverse wave (disturbance is perpendicular to wave direction)

(b) wavelength is marked on the graph: $\lambda = 40\,cm$

This gives us wavenumber $k = \frac{2\pi}{\lambda} = 0.157\ \frac{rad}{cm}$

and we can't solve for any of the other quantity

(c) wave speed is how fast the "crests" (or envelope) of the wave are moving (in the x-direction)



max particle speed is how fast any one dot is moving up or down only

② Given Eq 16.1 $v_{string} = \sqrt{\frac{T_s}{\mu}}$ so the speed of a wave on a string depends only on the tension and the linear mass density of the string

This means only increasing tension (e) or decreasing μ (d) would increase the speed of the wave on the string.

g. for (a) speed doesn't change, but frequency increases, so wavelength and $v = \lambda f$