

Chapter 14

Types of waves	longitudinal (media displacements parallel to direction of propagation) transverse (displacements perpendicular to direction of wave travel) torsional (a twist is transmitted through the media)
Velocity of a wave on a string	$v = f * \lambda$, where λ is the wavelength also note that $v = \sqrt{F/\mu}$ where F is the tension in the string and μ is the mass per unit length of the string.
Amplitude y of a transverse traveling wave as a function of position and time	$y(x,t) = A * \cos(2 * \pi * (x/\lambda + t/T))$, where λ is the wavelength and T is the period

speed of sound in air	343 m/s
sound intensity	$I = E/A \cdot t = P/A$ [=] watts/m ²
sound intensity at a distance r from a spherically radiating source of power P	$I = P/(4 \cdot \pi \cdot r^2)$

definition of the dB scale for sound intensity level	$\beta = 10 \cdot \log(I/I_0) ;$ $I_0 = 10^{-12} \text{ watts/m}^2$
formula for the Doppler effect	$f' = ((1+u_o/v)/(1-u_s/v)) \cdot f$ where f' is the frequency heard by the observer and where u_o is the velocity of the observer and u_s the velocity of the source. u_o and u_s are positive where source and observer are approaching each other. Here f is the frequency of the source and v is the speed of sound in air.
Destructive interference	when crests fill troughs (or when Compressions cancel rarefactions)

Nodes (antinodes)	Locations along a wave at which there is no displacement. (Or where there is a maximum displacement.)
Standing Waves	a wave pattern in which there are nodes and antinodes located at fixed positions. Nodes are found at the fixed ends of vibrating strings, and, depending on the frequency of the standing wave, at the midpoint or one third point and two thirds point etc. along the string. In an air column there will always be a node at the closed end of a pipe and antinode(s) at the open end(s).
Beats	a pulsation in the sound intensity when two sound sources of differing frequency are sounded simultaneously. The frequency of these pulsations is called the beat frequency and is equal to the difference between the two parent frequencies.