Chapter 16-17 4-Min Drill

Frequency in terms the wave period $f = \frac{1}{T}$

$T \uparrow$

Wave period in terms of frequency $T = \frac{1}{f}$

Velocity of a wave in terms of wavelength and frequency

$v = \lambda f$

Speed of sound in terms of air temperature

$V_{sound} = 331.4 + 0.6(T_c)$ or $V_{sound} = 331.3\sqrt{1 + \frac{T_c}{273.15}}$

Frequency observed when the sound source and/or observer is moving

$f_o = f_s \frac{V \pm V_o}{V \pm V_s}$

Velocity of a passing vehicle in terms of sound velocity and pitch drop

$V_{vehicle} = V_{sound}\left(\frac{2^{n/12} - 1}{2^{n/12} + 1}\right)$ n = change in pitch, in 1/2 steps

Beat frequency when two frequencies f_1 and f_2 are heard together

$f_{beats} = |f_1 - f_2|$

Fundamental wavelength in a tube with 1 open end, in terms of tube length (L)

$\lambda = 4L$

Fundamental wavelength in a tube with 2 open ends, in terms of tube length (L)

$\lambda = 2L$

Fundamental wavelength in a tube with 2 closed ends, in terms of tube length (L)

$\lambda = 2L$

Fundamental wavelength of a plucked guitar string, in terms of string length (L)

$\lambda = 2L$

Frequency (f) of a musical note n half-steps higher than another note with frequency f_0 $f = f_0(2^{n/12})$