Chapter 15

$v = f\lambda$ $k = \frac{2\pi}{\lambda}$ $\omega = 2\pi f = \frac{2\pi}{T}$ $\frac{\partial^2 y(x,t)}{\partial x^2} = \frac{1}{v^2}\frac{\partial^2 y(x,t)}{\partial t^2}$

$\frac{\partial y(x,t)}{\partial t} = \mp v\frac{\partial y(x,t)}{\partial x}$ $v = \sqrt{\frac{F}{\mu}}$ $Power = F_y(x,t)v_y(x,t)$ $P_{av} = \frac{1}{2}\sqrt{\mu F}\omega^2 A^2$

$\frac{I_1}{I_2} = \frac{r_2^2}{r_1^2}$ $y(x,t) = A_{sw}\sin(kx)\cos(\omega t)$

Chapter 16

$p(x,t) = -B\frac{\partial y(x,t)}{\partial x}$ $p_{max} = BkA$ $v = \sqrt{\frac{B}{\rho}}$ $v = \sqrt{\frac{\gamma RT}{M}}$

$T_{kelvin} = T_C + 273.15$ $v = \sqrt{\frac{Y}{\rho}}$ $I = \langle p(x,t)v_y(x,t)\rangle_t$ $I = \frac{1}{2}\sqrt{\rho B}\omega^2 A^2$

$\beta = (10dB)\log\frac{I}{I_0}$ $I_0 = 10^{-12}\frac{W}{m^2}$ $f_{beat} = f_a - f_b$ $f_L = \frac{v+v_L}{v+v_S}f_S$

$\sin\alpha = \frac{v}{v_S}$

Chapter 21

$F = k\frac{|q_1 q_2|}{r^2} = \frac{1}{4\pi\epsilon_0}\frac{|q_1 q_2|}{r^2}$ $\epsilon_0 = 8.85\times10^{-12}\frac{C^2}{Nm^2}$ $k = 8.988\times10^9\frac{Nm^2}{C^2}$ $\vec{E} = \frac{1}{4\pi\epsilon_0}\frac{q}{r^2}\hat{r}$

$p = dq$ $\vec{\tau} = \vec{p}\times\vec{E}$

Chapter 22

$\Phi_E \equiv \int \vec{E}\cdot d\vec{A}$ $\oint \vec{E}\cdot d\vec{A} = \frac{Q_{encl}}{\epsilon_0}$

Chapter 23

$V = \frac{1}{4\pi\epsilon_0}\frac{q}{r}$ $-\Delta V = V_a - V_b = \int_a^b \vec{E}\cdot d\vec{l}$ $\vec{E} = -\left(\hat{i}\frac{\partial V}{\partial x} + \hat{j}\frac{\partial V}{\partial y} + \hat{k}\frac{\partial V}{\partial z}\right)$

Chapter 24

$C = \frac{Q}{V_{ab}}$ $C_{series} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3} + ...$ $C_{parallel} = C_1 + C_2 + C_3 + ...$ $U = \frac{1}{2}CV^2 = \frac{1}{2}QV$

$u = \frac{1}{2}\epsilon_0 E^2$ $C = KC_0$ $u = \frac{1}{2}K\epsilon_0 E^2$ $\oint K\vec{E}\cdot d\vec{A} = \frac{Q_{encl-free}}{\epsilon_0}$