

Chapter 15

$$\begin{aligned}
 v &= f\lambda & k &= \frac{2\pi}{\lambda} & \omega &= 2\pi f = \frac{2\pi}{T} & \frac{\partial^2 y(x,t)}{\partial x^2} &= \frac{1}{v^2} \frac{\partial^2 y(x,t)}{\partial t^2} \\
 \frac{\partial y(x,t)}{\partial t} &= \mp v \frac{\partial y(x,t)}{\partial x} & v &= \sqrt{\frac{F}{\mu}} & \text{Power} &= F_y(x,t)v_y(x,t) & P_{av} &= \frac{1}{2}\sqrt{\mu F}\omega^2 A^2 \\
 \frac{I_1}{I_2} &= \frac{r_2^2}{r_1^2} & y(x,t) &= A_{sw} \sin(kx) \cos(\omega t)
 \end{aligned}$$

Chapter 16

$$\begin{aligned}
 p(x,t) &= -B \frac{\partial y(x,t)}{\partial x} & p_{max} &= BkA & v &= \sqrt{\frac{B}{\rho}} & v &= \sqrt{\frac{\gamma RT}{M}} \\
 T_{kelvin} &= T_C + 273.15 & v &= \sqrt{\frac{Y}{\rho}} & I &= \langle p(x,t)v_y(x,t) \rangle_t & I &= \frac{1}{2}\sqrt{\rho B}\omega^2 A^2 \\
 \beta &= (10dB) \log \frac{I}{I_0} & I_0 &= 10^{-12} \frac{W}{m^2} & f_{beat} &= f_a - f_b & f_L &= \frac{v+v_L}{v+v_S} f_S
 \end{aligned}$$

Chapter 21

$$\begin{aligned}
 F &= k \frac{|q_1 q_2|}{r^2} = \frac{1}{4\pi\epsilon_0} \frac{|q_1 q_2|}{r^2} & \epsilon_0 &= 8.85 \times 10^{-12} \frac{C^2}{Nm^2} & k &= 8.988 \times 10^9 \frac{Nm^2}{C^2} & \vec{E} &= \frac{1}{4\pi\epsilon_0} \frac{q}{r^2} \hat{r} \\
 p &= dq & \vec{\tau} &= \vec{p} \times \vec{E}
 \end{aligned}$$

Chapter 22

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

Chapter 23

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