Physics 210 Formula Sheet 3

$$\gamma = \frac{1}{\sqrt{1 - \left(\frac{v}{c}\right)^2}}$$

$$L = \frac{L_o}{\gamma}$$

$$t = \gamma\, t_o$$

$$f_{observed} = \frac{\sqrt{1 + \left(\frac{v}{c}\right)^2}\,\left(f_{source}\right)}{\sqrt{1 - \left(\frac{v}{c}\right)^2}}$$

$$x' = \gamma\,(x - v\,t)$$

$$y' = y$$

$$z' = z$$

$$t' = \gamma\left(t - \frac{v\,x}{c^2}\right)$$

$$u = \frac{u' + v}{1 + \frac{u'\,v}{c^2}}$$

$$(1 + x)^n \cong 1 + n\,x + \frac{1}{2}\left(n\,(n-1)\,x^2\right)$$

$$p = \gamma\, m_o\, v$$

$$E_o = m_o\, c^2$$

$$K = (\gamma - 1)\, E_o$$

$$E = K + E_o$$

$$E^2 = E_o^2 + (p\,c)^2$$

$$u\,(f\,,T) = \frac{8\,\pi\,h\,f^3}{c^3}\left(\frac{1}{e^{\left(\frac{hf}{k_B\,T}-1\right)}}\right)$$

$$E = h\,f = \frac{h\,c}{\lambda}$$

$$E = \frac{1}{2}\,m_e\,v_{max}^2 + \phi$$

$$\phi = h\,f_o$$

$$\Delta\,\lambda = \frac{hc}{m_e\,c^2}\,(1 - \cos\theta)$$

$$\frac{1}{\lambda} = R\left(\frac{1}{n_f^2} - \frac{1}{n_i^2}\right)$$

$$E_n = -\left(\frac{k\,e^2}{2\,a_o}\right)\left(\frac{1}{n^2}\right)$$

$$p = \frac{h}{\lambda}$$

$$n\,\lambda = 2\,d\,\sin\theta$$

$$\Delta\,p_x\,\Delta\,x \geq \frac{\hbar}{2}$$

$$\Delta\,E\,\Delta\,t \geq \frac{\hbar}{2}$$

$$-\left(\frac{\hbar^2}{2\,m}\right)\frac{d^2\varphi}{dx^2} + U\,(x)\,\varphi = E\,\varphi$$

$$P = \int_{-\infty}^{\infty} \varphi^2\,dx$$