Equations for PHYS 320 Test 1

$$t = \frac{t_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$L = L_0\sqrt{1 - \frac{v^2}{c^2}}$$

$$f = f_0\sqrt{1 - v^2/c^2}$$

$$f = f_0\sqrt{\frac{1 + v/c}{1 - v/c}}$$

$$f\lambda = c$$

$$\gamma = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$x' = \gamma(x - vt) \quad y' = y \quad z' = z \quad t' = \gamma(t - vx/c^2)$$

$$V_{x'} = \frac{V_x - v}{1 - \frac{V_x v}{c^2}} \quad V_{y'} = \frac{V_y}{\gamma(1 - \frac{V_x v}{c^2})} \quad V_{z'} = \frac{V_z}{\gamma(1 - \frac{V_x v}{c^2})}$$

Inverses:

$x = \gamma(x' + vt')$, etc.

Also:

$$\vec{p} = \gamma_v m\vec{v}$$

$$E = \gamma mc^2$$

$$E^2 = (mc^2)^2 + (pc)^2$$

$$(\Delta s)^2 = (c\Delta t)^2 - (\Delta x)^2$$