

# Equations for Special Relativity

$$\beta = v/c$$

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

$$\Delta t = \gamma \Delta \tau$$

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

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

$$x' = \gamma(x - vt)$$

$$x = \gamma(x' + vt')$$

$$t' = \gamma\left(t - vx/c^2\right)$$

$$t = \gamma\left(t' + vx'/c^2\right)$$

$$u' = \frac{u - v}{1 - uv/c^2}$$

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

$$p = \gamma mv$$

$$E_0 = mc^2$$

$$K = (\gamma - 1)mc^2$$

$$E = \gamma mc^2 = E_0 + K$$

$$E^2 - (pc)^2 = E_0^2$$