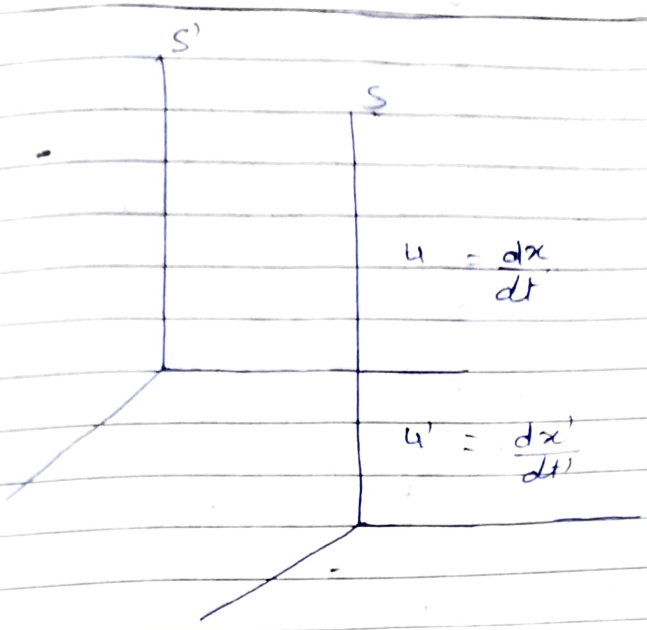
ADDITION OF VELOCITIES



$$x' = \frac{x - Vt}{\sqrt{1 - V^2/c^2}} \quad \text{---(i)}$$

$$t' = \frac{t - \frac{xV}{c^2}}{\sqrt{1 - \frac{V^2}{c^2}}} \quad \text{---(ii)}$$

$$dx' = \frac{dx - Vdt}{\sqrt{1 - \frac{V^2}{c^2}}}$$

$$dt' = \frac{dt - \frac{dxV}{c^2}}{\sqrt{1 - \frac{V^2}{c^2}}}$$

$$\frac{dx'}{dt'} = \frac{dx - Vdt}{dt - \frac{Vdx}{c^2}}$$

$$\frac{dx'}{dt'} = \frac{\frac{dx - Vdt}{dt}}{\frac{dt - \frac{Vdx}{c^2}}{dt}}$$

$$= \frac{\frac{dx}{dt} - \frac{v\,dt}{dt}}{\frac{dt}{dt} - \frac{v}{c^2}\frac{dx}{dt}}$$

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

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

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

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

$$u = \frac{c + v}{\frac{c + v}{c}} = c$$

$$\boxed{u = c.}$$

—x—