

# Преобразования Лоренца

$\boxed{1}$  Теорема

$$x = \frac{x' + vt'}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$x' = \frac{x - vt}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$y = y'$$

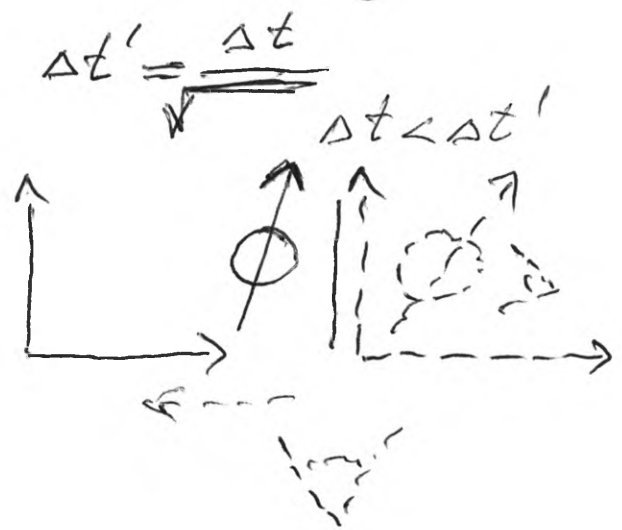
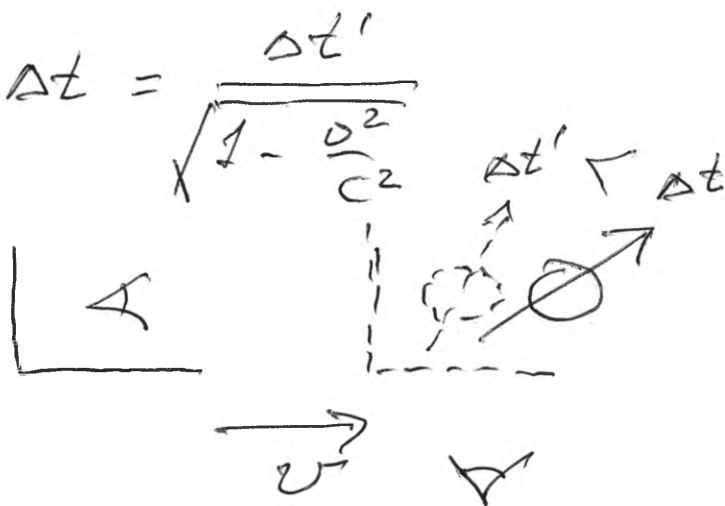
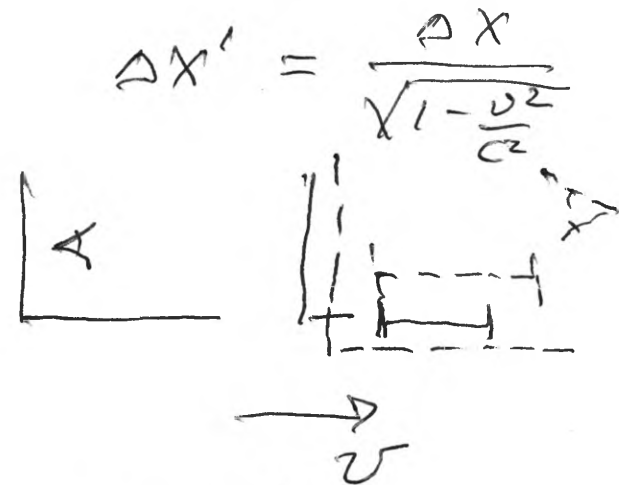
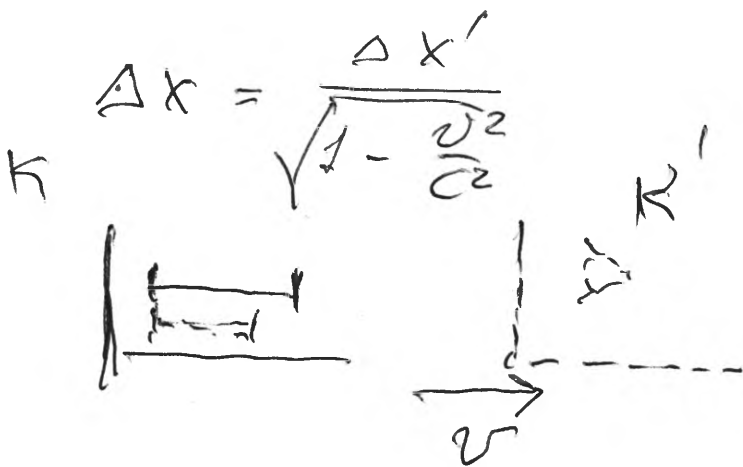
$$y' = y$$

$$z = z'$$

$$z' = z$$

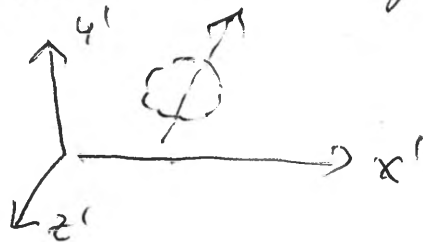
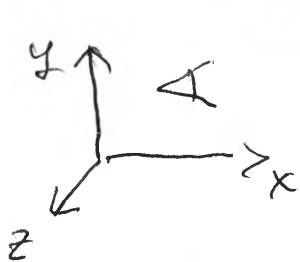
$$t = \frac{t' + \frac{x'v}{c^2}}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$t' = \frac{t - \frac{xv}{c^2}}{\sqrt{1 - \frac{v^2}{c^2}}}$$



# Собственное время

2



Теор  
мех

$$ds^2 = c^2 dt^2 - dx^2 - dy^2 - dz^2 = c^2 dt'^2 - dx'^2 - dy'^2 - dz'^2$$

$$dx' = dy' = dz' = 0$$

$$dt' = dt \sqrt{1 - \frac{dx^2 + dy^2 + dz^2}{c^2 dt^2}}$$

$$dt' = dt \sqrt{1 - \frac{dx^2 + dy^2 + dz^2}{c^2 dt^2}}$$

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

$$t_2' - t_1' = \int_{t_1}^{t_2} dt \sqrt{1 - \frac{v^2}{c^2}}$$