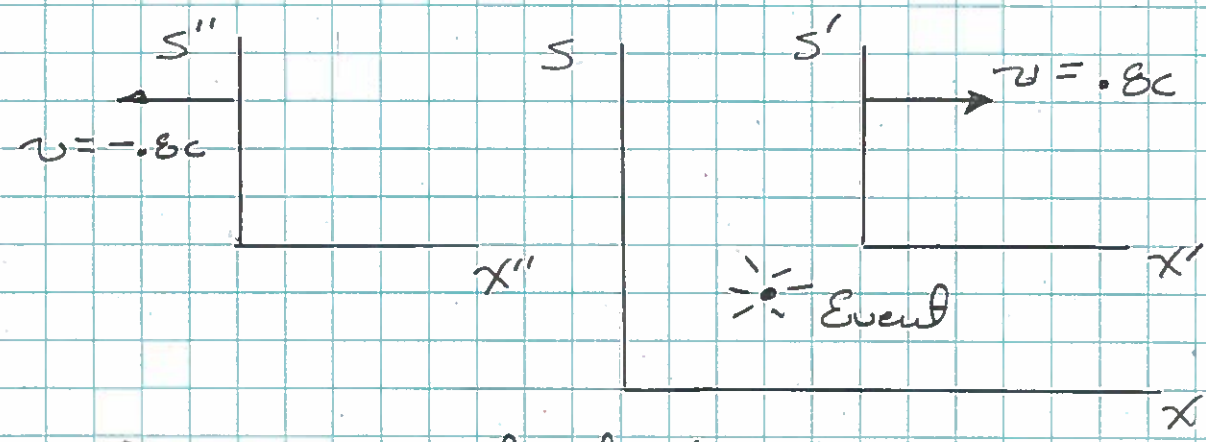

In S: event at $(x = 1200\text{m}, t = 2\text{ms})$

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

$v = 0.8c \quad \gamma = \frac{1}{\sqrt{1 - v^2/c^2}} = 1.67$

$x' = \gamma(x - 0.8ct) = \underline{1202.4\text{ m}}$

$t' = \gamma\left(t - \frac{vx}{c^2}\right) = \gamma\left(t - \frac{.8x}{c}\right)$

$\underline{t' = -2.004 \times 10^{-6}\text{ s}}$

$(x', t') = (1202.4\text{m}, -2.004 \times 10^{-6}\text{s})$

In S'' (Here $v = -.8c$) $\gamma = \frac{1}{\sqrt{1 - v^2/c^2}} = 1.67$

$x'' = \gamma(x - vt) = \gamma(x + .8ct)$

$= \underline{2805.6\text{ m}}$

$t'' = \gamma\left(t - \frac{vx}{c^2}\right) = \gamma\left(t + \frac{.8x}{c}\right)$

$= 8.684 \times 10^{-6}\text{s}$

$\underline{(x'', t'') = (2805.6\text{m}, 8.684 \times 10^{-6}\text{s})}$