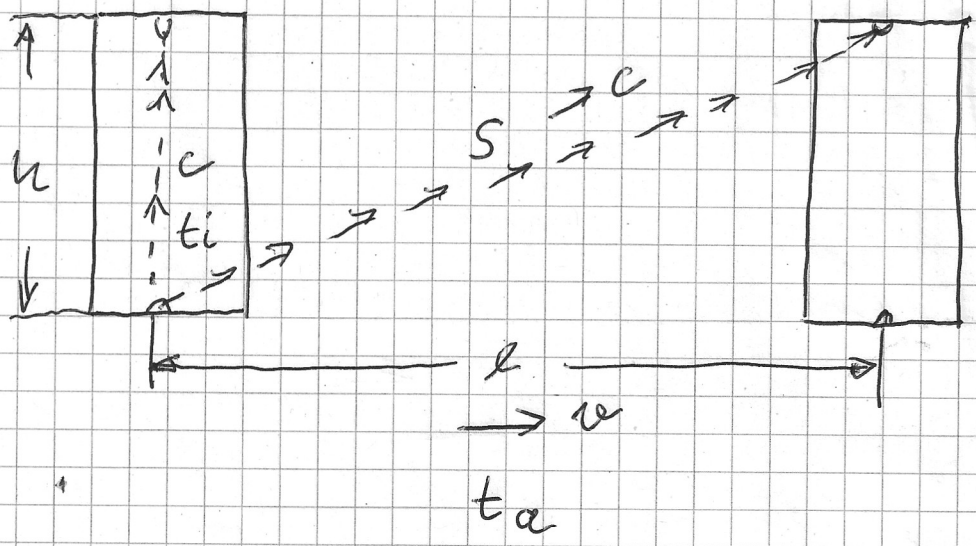

INNEN

$$t_i = \frac{h}{c} \rightarrow h = t_i \cdot c$$

AUSSEN

$$t_a = \frac{s}{c} \rightarrow s = t_a \cdot c$$

$$t_a = \frac{l}{v} \rightarrow l = t_a \cdot v$$

PYTHAGORAS:

$$h^2 = s^2 - l^2$$

$$h^2 = t_a^2 \cdot c^2 - t_a^2 \cdot v^2 = t_i^2 \cdot c^2$$

$$t_i^2 \cdot c^2 = t_a^2 (c^2 - v^2)$$

$$t_i^2 \cdot c^2 = t_a^2 \cdot c^2 \left(1 - \frac{v^2}{c^2}\right)$$

$$t_i^2 = t_a^2 \left(1 - \frac{v^2}{c^2}\right)$$

$$t_i = t_a \cdot \sqrt{1 - \frac{v^2}{c^2}}$$

$$\boxed{\frac{t_i}{t_a} = \sqrt{1 - \frac{v^2}{c^2}}}$$