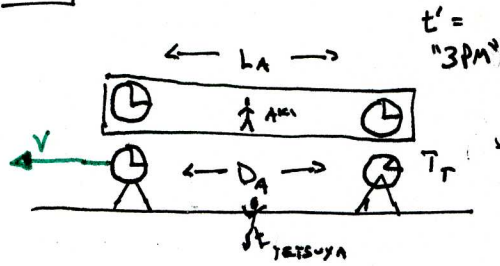


LENGTH CONTRACTION V2

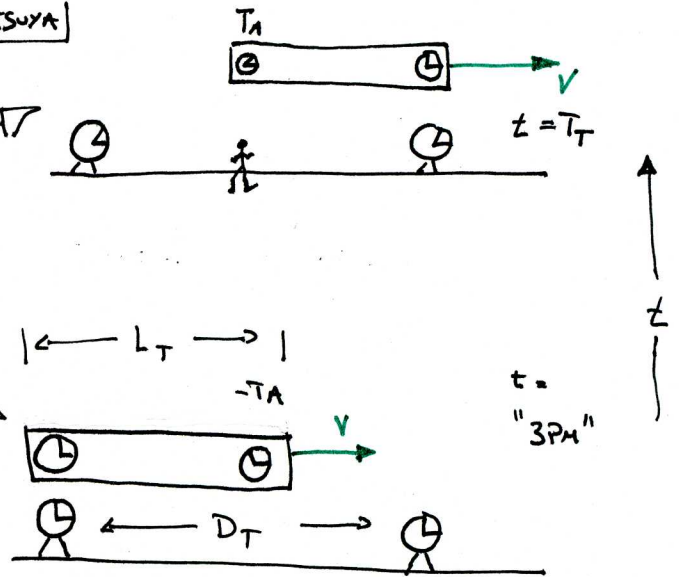
FALL 2008

SPATIAL SNAPSHOTS

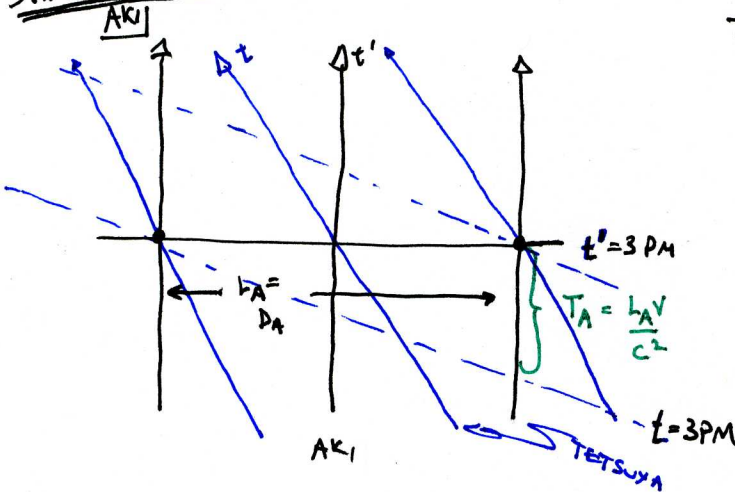


By choice, $L_A = D_A$ (1)
(WITHOUT LOSS OF GENERALITY)

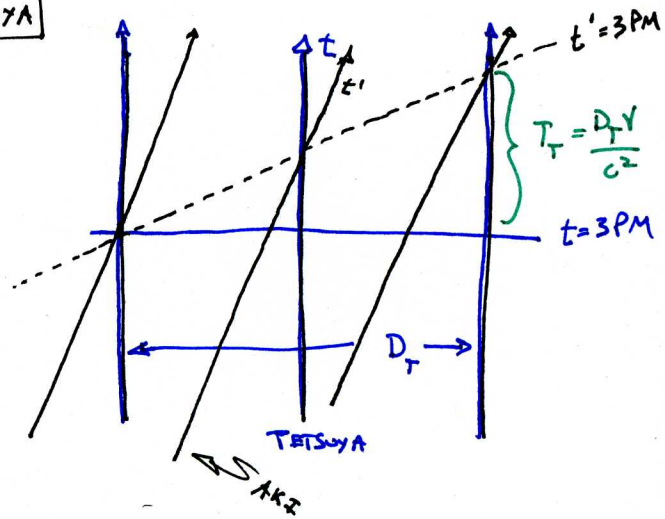
TETSUYA



SPACE-TIME DIAGRAM



TETSUYA



BY THE RELATIVITY PRINCIPLE

$$\frac{L_T}{L_A} = \frac{D_A}{D_T} \quad (2)$$

FROM THE SPACE-TIME DIAGRAM
(AND THE ABSTRACT "RULE")

$$T_T = \frac{D_T v}{c^2} \quad (3) \text{ AND } T_A = \frac{L_A v}{c^2} \quad (4)$$

FROM THE TETSUYA SPATIAL SNAPSHOTS,

$$D_T = L_T + v T_T \quad (5)$$

NOW ALGEBRA! (3) AND (4) GIVE

$$\frac{T_A}{T_T} = \frac{\frac{L_A v}{c^2}}{\frac{D_T v}{c^2}} = \frac{L_A}{D_T} \stackrel{\text{FROM (1)}}{=} \frac{D_A}{D_T} \stackrel{\text{FROM (2)}}{=} \frac{L_T}{L_A} = \frac{1}{\gamma} \quad \left[\text{WHAT WE CALLED "M" FOR MYSTERY IN CLASS} \right] \quad (6)$$

FROM (5) AND (3) $D_T = L_T + \frac{D_T v^2}{c^2} \Rightarrow L_T = D_T \left(1 - \frac{v^2}{c^2} \right) \quad (7)$

