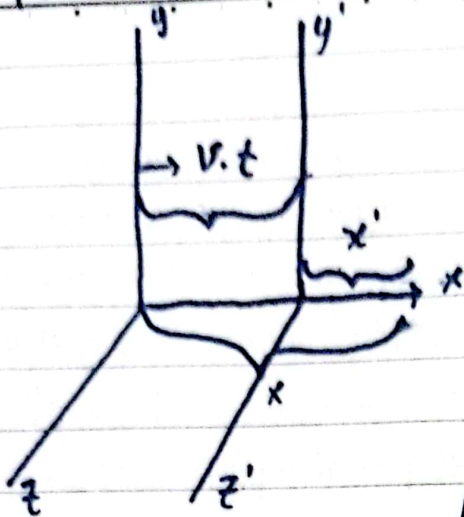


Relativitas:



$$x' = x - v \cdot t$$

$$\frac{dx'}{dt} = \frac{dx}{dt} - v \frac{dt}{dt}$$

$$V_{x'} = V_x - v \quad \& \quad V_{x'} = V_x + v$$

$$y = y'$$

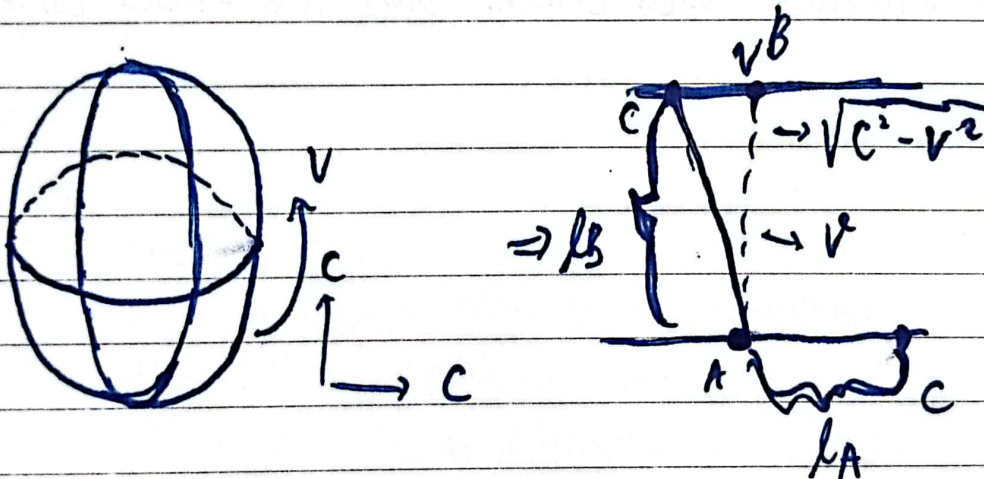
$$\frac{dy}{dt} = \frac{dy'}{dt}$$

$$z = z'$$

$$\frac{dz}{dt} = \frac{dz'}{dt}$$

Percepatan galileo galilei

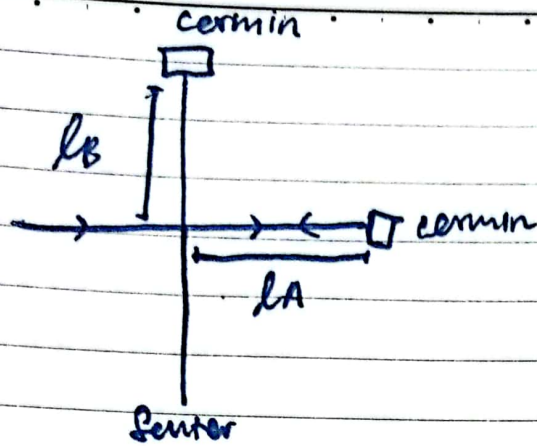
$$V = \frac{\Delta x}{\Delta t}$$



$$t_B = \frac{l_B}{\sqrt{c^2 - v^2}} + \frac{l_B}{\sqrt{c^2 + v^2}} = \frac{2l_B}{\sqrt{c^2 - v^2}}$$

$$t_A = \frac{l_A}{c+v} + \frac{l_A}{c-v} = l_A \left[\frac{1}{c+v} + \frac{1}{c-v} \right]$$

$$l_A \left[\frac{(c-v) + (c+v)}{c^2 - v^2} \right]$$



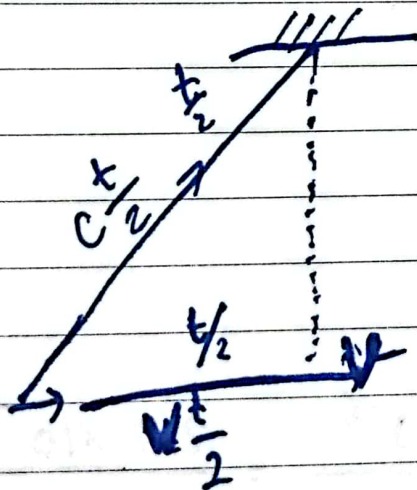
Ilustrasi Percobaan.

~~4/5~~

$$\frac{t_B}{t_A} = \frac{\frac{2l_B}{\sqrt{c^2 - v^2}}}{\frac{2l_A c}{c^2 - v^2}} = \frac{l_B (c^2 - v^2)}{l_A c \sqrt{c^2 - v^2}} = l_A \left(\frac{2c}{c^2 - v^2} \right)$$

$$= \frac{l_B}{l_A c} \sqrt{c^2 - v^2}$$

Pemuaian Waktu



$$\left(\frac{ct}{2} \right)^2 = \left(\frac{x}{2} \right)^2 + \left(v \frac{t}{2} \right)^2$$

$$c^2 \frac{t^2}{4} = \frac{x^2}{4} + v^2 \frac{t^2}{4}$$

$$l_0^2 = \frac{t^2}{4} (c^2 - v^2)$$

$$4l_0^2 = t^2 (c^2 - v^2)$$

$$t^2 = \frac{4l_0^2}{(c^2 - v^2)} = \frac{4l_0^2}{c^2 \left(1 - \frac{v^2}{c^2} \right)}$$

$$= \frac{4l_0^2/c^2}{(1 - \frac{v^2}{c^2})}$$

$$t = \frac{2l_0/c}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$t = \frac{t_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

Example:

Pengelasan:

Diket: $t_0 = 2,5 \times 10^{-6}$ detik.

$v = 0,9c$

Ditanya: $t \dots ?$

Jawab:

$$t = \frac{t_0}{\sqrt{1 - \frac{v^2}{c^2}}} = \frac{2,5 \times 10^{-6}}{\sqrt{1 - (0,9)^2}} = \frac{2,5 \times 10^{-6}}{\sqrt{1 - 0,81}} = \frac{2,5 \times 10^{-6}}{\sqrt{0,19}}$$

$$t = \frac{2.5 \times 10^{-8}}{0.4359} = 5.73 \times 10^{-6} \text{ detik.}$$

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