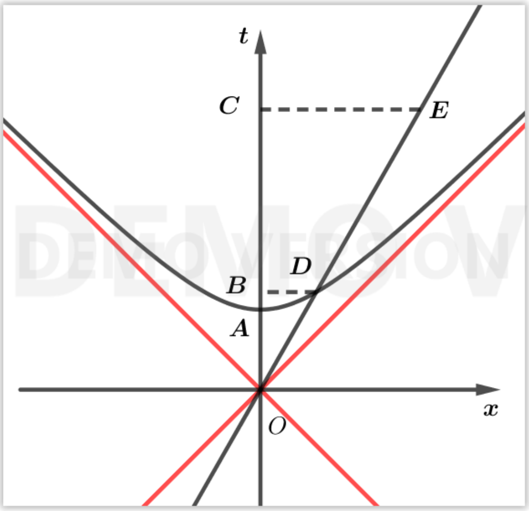

$$OE = k \cdot OC = kt_E$$
$$OA = OD = 1$$
$$OD = k \cdot OB = kt_D$$

$$OE = \frac{OE}{OD} = \frac{k \cdot OC}{k \cdot OB} = \frac{t_E}{t_D}$$

Let's apply these to spacetime endowed with the Minkowski metric, as in the figure.
We consider all physical quantities divided by their unit of measure. For example for SI:

$$v \leftarrow \frac{v}{[m/s]},\ t \leftarrow \frac{t}{[s]},\ x \leftarrow \frac{x}{[m]} \tag{1}$$

$$\begin{cases} t^2 - x^2 = 1 & (2) \\ x = \dfrac{v}{c} t & (3) \\ x = x_D & (4) \\ t = t_D & (5) \end{cases}$$

$$\begin{cases} t_D^2 - \dfrac{v^2}{c^2} t_D^2 = 1 & (6) \\ OE = \dfrac{t_E}{t_D} & (7) \end{cases}$$

$$\begin{cases} t_D = \dfrac{1}{\sqrt{1 - \dfrac{v^2}{c^2}}} & (8) \\ OE^2 = \left(1 - \dfrac{v^2}{c^2}\right) t_E^2 & (9) \end{cases}$$

$$\boxed{OE^2 = t_E^2 - \frac{v^2}{c^2} t_E^2 = t_E^2 - x_E^2} \tag{10}$$

Q.E.D.