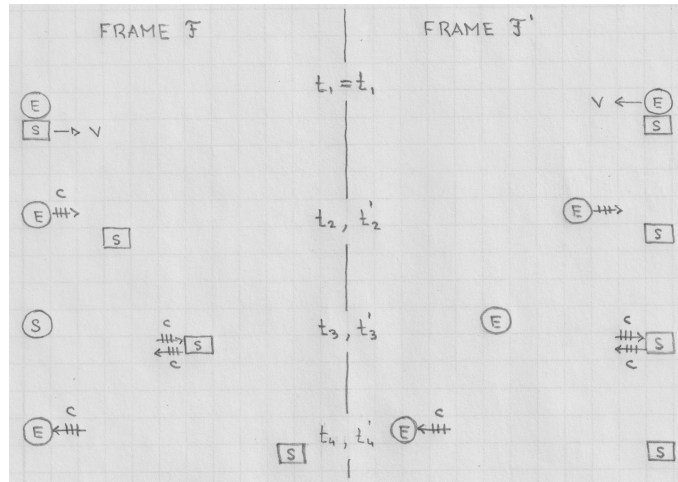## [lex90] Exchange of light signals

When a spaceship (frame $\mathcal{F}'$) passes Earth (frame $\mathcal{F}$) at relative velocity $v = 0.6c$ (event 1), clocks are synchronized: $t_1 = t_1' = 0$. At time $t_2 = 10$min a light signal is emitted from Earth toward the spaceship (event 2). At time t_3' the light signal is received on the spaceship and a light signal is emitted instantly toward Earth in reply (event 3). At time t_4 the reply signal is received on Earth.
(a) Identify the proper time intervals among Δt_{12}, Δt_{13}, Δt_{14}, $\Delta t_{12}'$, $\Delta t_{13}'$, $\Delta t_{14}'$.
(b) Determine these time intervals in units min.

Solution: