[mex207] Hello Earth

When a spaceship (frame S') passes Earth (frame S) at relative velocity $v = 0.6c$ (event 1), clocks are synchronized: $t_1 = t'_1 = 0$. At time $t_2 = 10\text{min}$ a light pulse is emitted from Earth toward the spaceship (event 2). At time t'_3 the light pulse is detected on the spaceship (event 3).
(a) Identify the proper time intervals among Δt_{12}, Δt_{13}, Δt_{23}, $\Delta t'_{12}$, $\Delta t'_{13}$, $\Delta t'_{23}$.
(b) Find the time of event 2 as recorded on the spaceship.
(c) Find the distance between Earth and spaceship at event 2 as seen in both frames.
(d) Find the time interval between events 2 and 3 as recorded on Earth and on the spaceship.
(e) Find the time of event 3 as recorded on Earth and on the spaceship.

Solution: