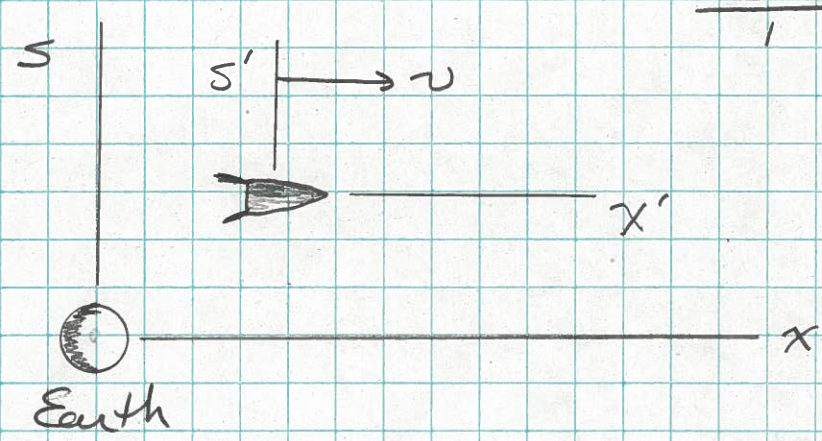

Measured in S: Ship travels 10 light-hours in $\Delta t = 15$ hrs

So $v = \frac{10\ lh}{15\ h} = \frac{2}{3}\ \frac{lh}{h}$

Observers in S' measure the proper time between the two events – i.e. entering and leaving the solar system.

So: $\Delta t' = \Delta t_p = \frac{1}{\gamma}\Delta t$

$$\gamma = \frac{1}{\sqrt{1 - v^2/c^2}} = \frac{1}{\sqrt{1 - (2/3)^2}} = 1.34$$

and $\Delta t' = \Delta t_p = \frac{1}{\gamma}\Delta t = \underline{11.16 \text{ hours}}$