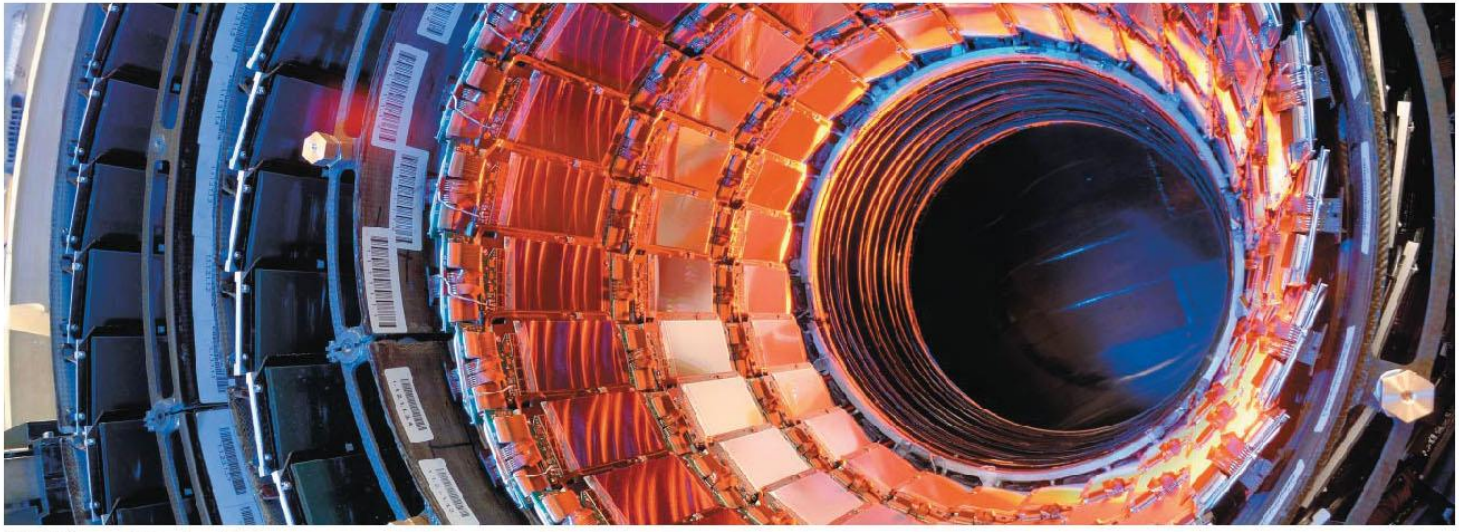
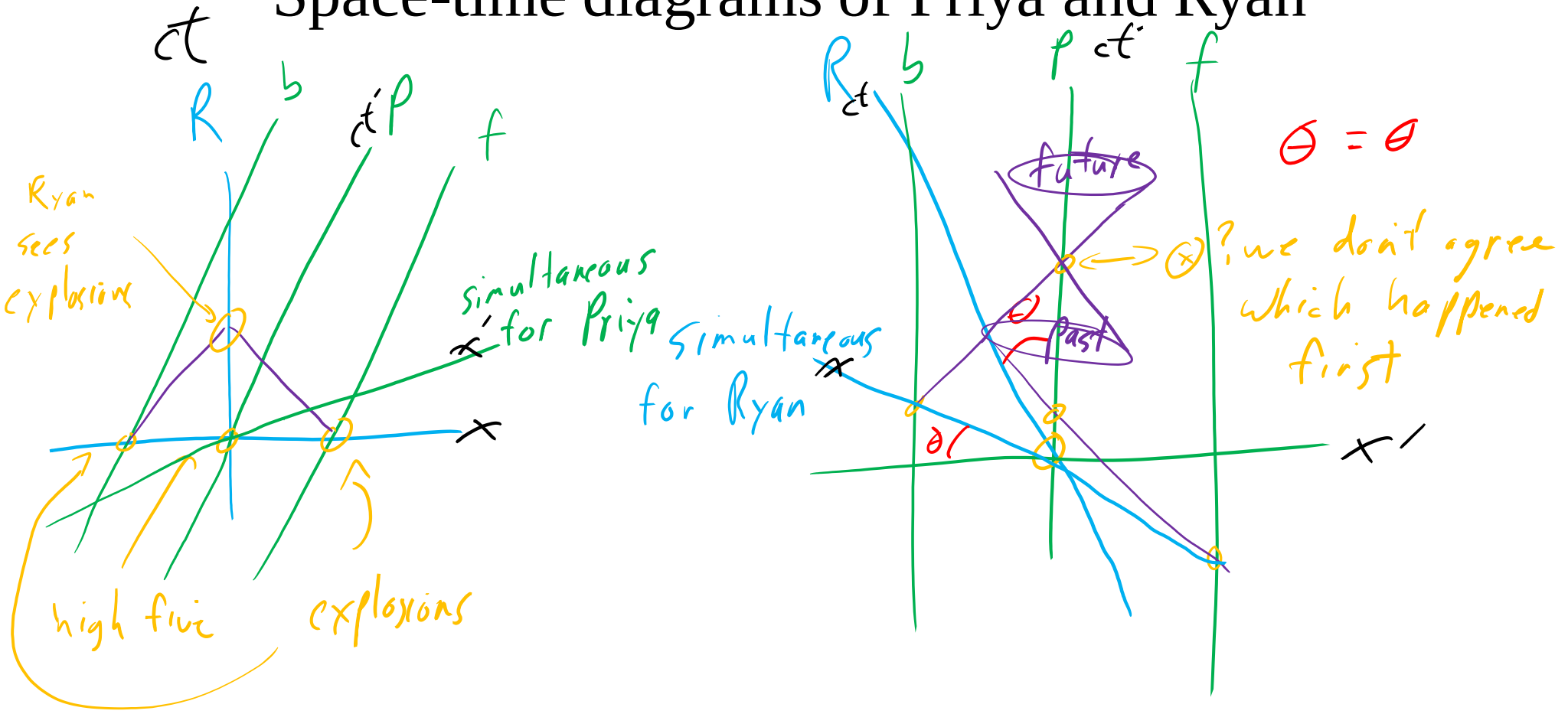
Twin Paradox: Twins have the same age. One gets on a rocket, flies away really fast, then comes back. If time dilation is a relativity thing (we will soon show that it is), when the twin returns which one is older?

Chapter 36 – Relativity

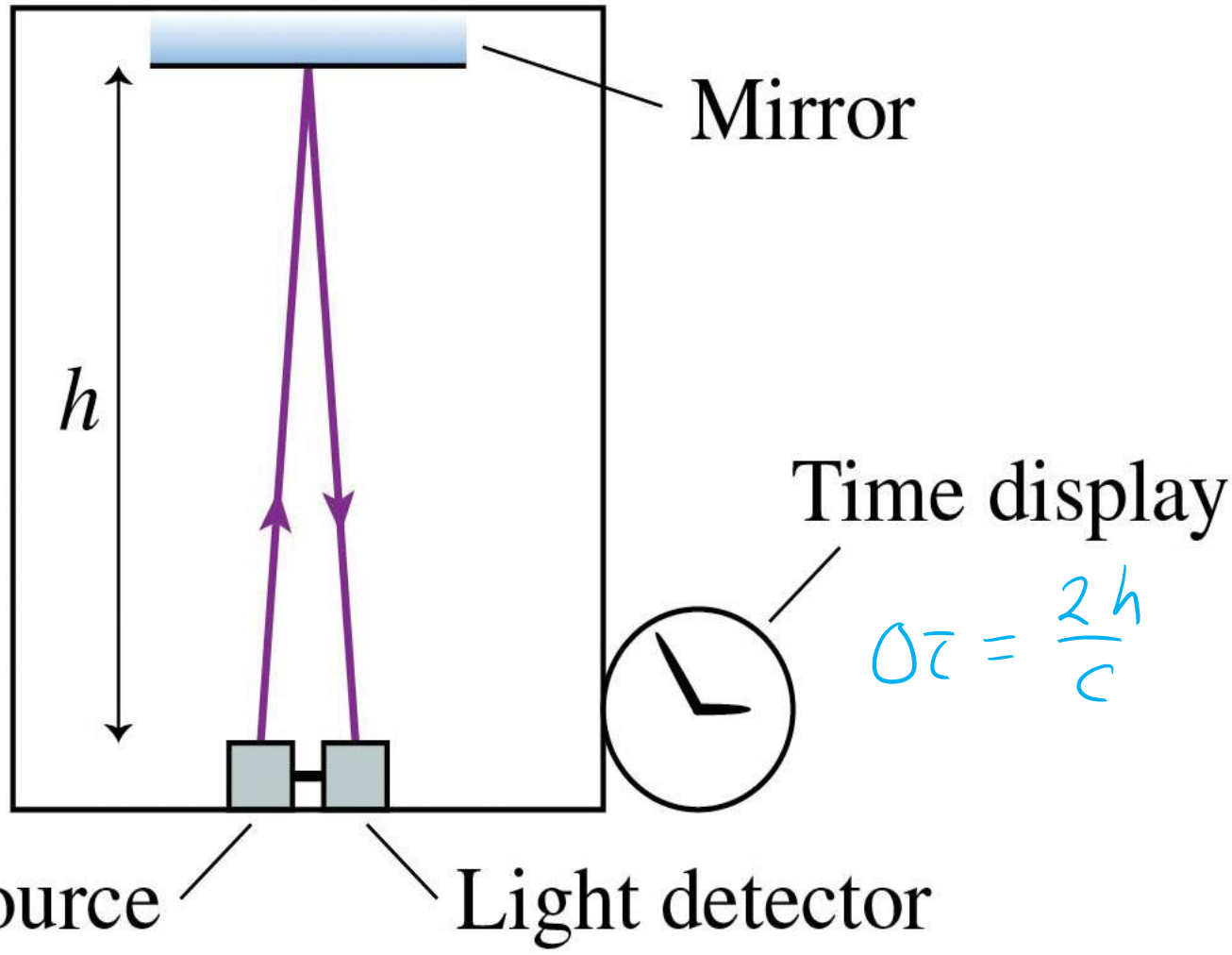
- Reference frames, events, measurements, space-time diagrams
- Postulates of special relativity, impact on simultaneity
- Time dilation, space contraction, and Lorentz transformations
- Relativistic momentum and energy



Space-time diagrams of Priya and Ryan

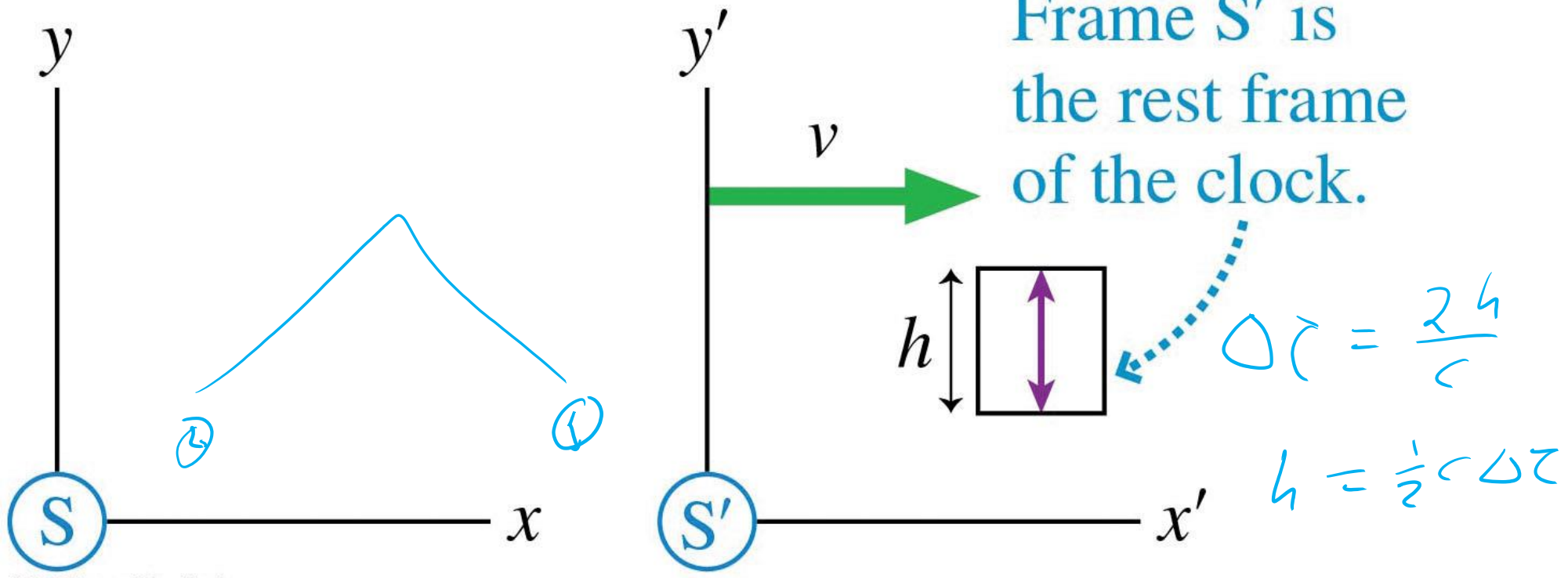


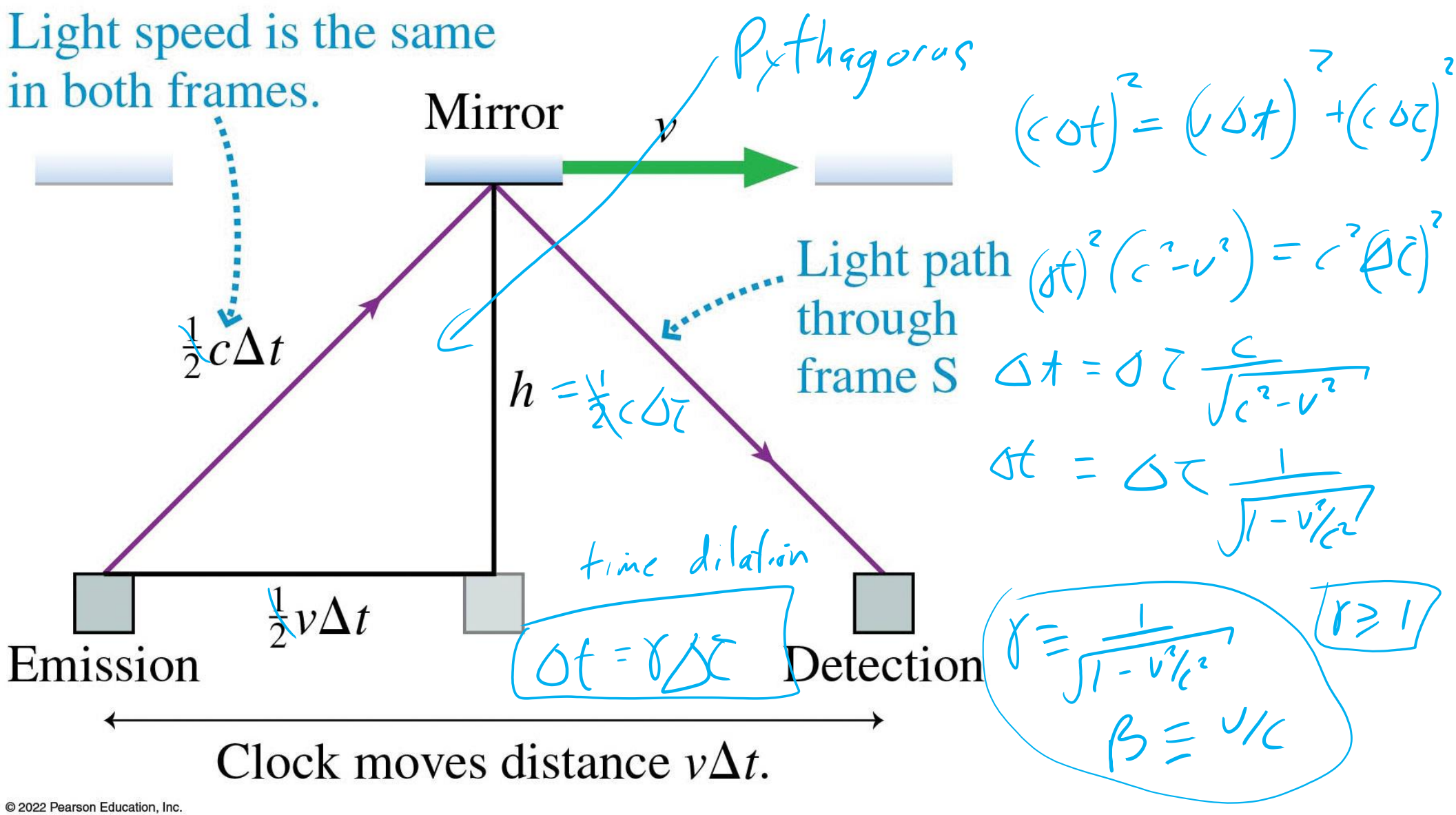
(a) A light clock



$$\Delta t = \frac{2h}{c}$$

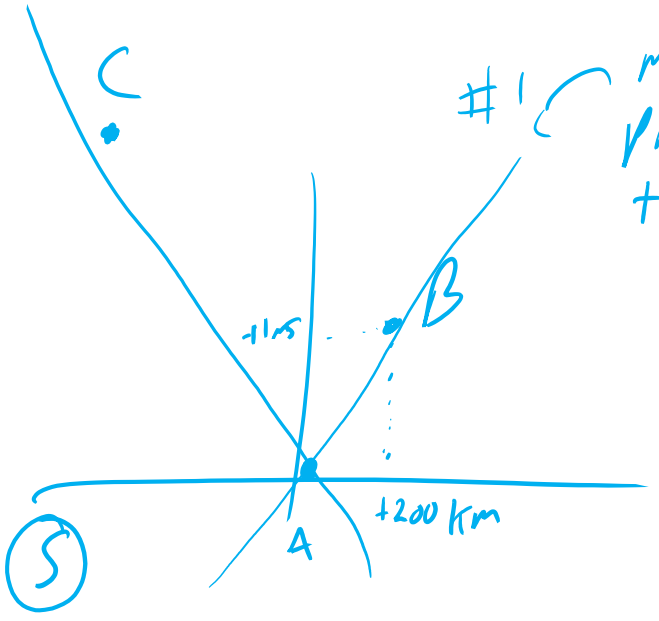
(b) The clock is at rest in frame S′.





Team Up questions

#2 (0,0) and (+200 km, +1 ms) and (-400 km, +2 ms)



#1 measures proper time } $v = 200 \frac{km}{ms} = \frac{2}{3}c$ — $\gamma = \ldots$

$\Delta t = \gamma \Delta \tau$

Greek tau (τ)