

Ch. 4

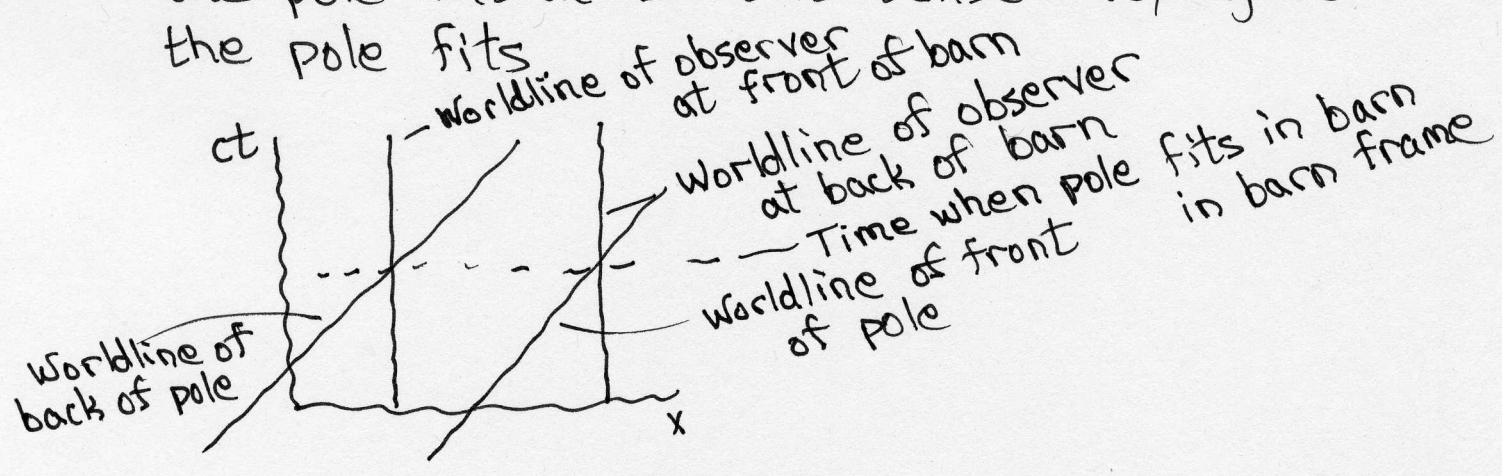
3. Proper length of pole = $L_{\text{pole}}^* = 20\text{m}$ In ~~the~~ frame of barn $L_{\text{pole}} = 10\text{m}$

Proper length of barn = $L_{\text{barn}}^* = 10\text{m}$ In frame of runner $L_{\text{barn}} = 5\text{m}$

Consider 2 observers in frame of barn, one at front door & one at rear door. These observers have synchronized their clocks. Both of these observers agree that the barn has ^{ve} length 10m ~~and the pole~~ in their frame, and the pole

~~They will both measure the same time on their clocks so~~

The observer at the front of the barn will see the pole reach the front door at the same time on his clock as the observer at the back of the barn sees the door close with the pole inside. In this sense they agree the pole fits



Find speed of runner

$$\frac{10\text{m}}{20\text{m}} = \sqrt{1 - \frac{v^2}{c^2}} \Rightarrow v = 0.866c$$

