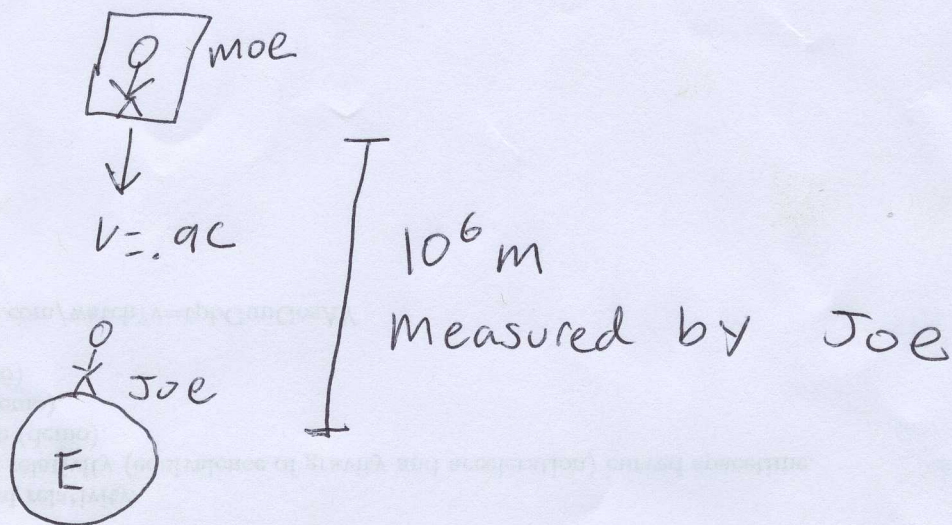


HW 4

① a)



b)

$$L_{\text{moe}} = L_{\text{Joe}} \sqrt{1 - \frac{v^2}{c^2}} = L_{\text{Joe}} \sqrt{1 - .81} \sim 4 \times 10^5 \text{ m}$$

To moe, Earth is approaching at $.9c$, hence the distance is contracted.

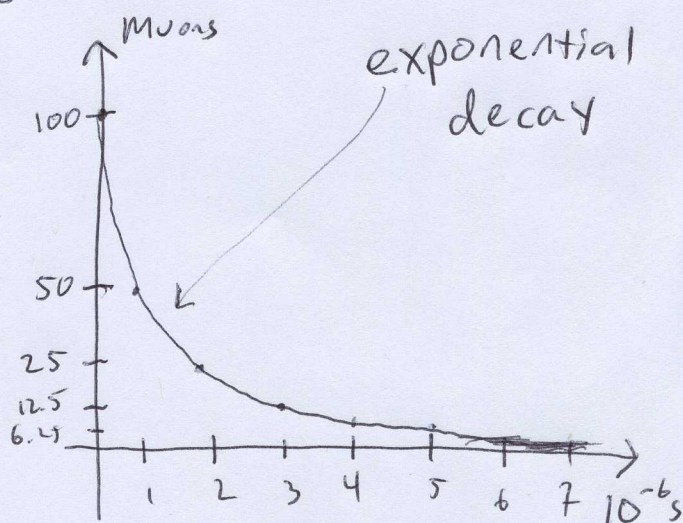
HW 4

③ a) $\tau_n = 10^{-6} s$

The half-life is the time, on average, for your muon supply to reduce by $\frac{1}{2}$.

Some points for the graph are

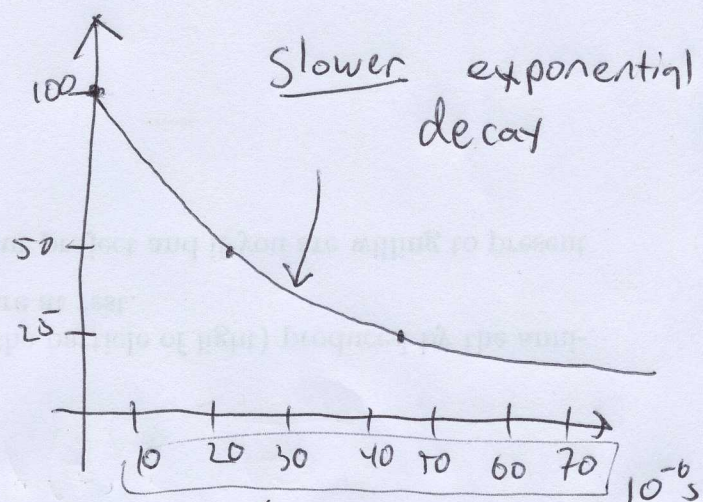
(100, 0s)
(50, τ_n)
(25, $2\tau_n$)
(12.5, $3\tau_n$)
(6.25, $4\tau_n$)
(3.125, $5\tau_n$)



b) $V = .999c$

$$(\tau_n)_{\text{Lab}} = \frac{(\tau_n)}{\sqrt{1 - \frac{v^2}{c^2}}} \approx 22 \tau_n$$

(100, 0s)
(50, $22\tau_n$)
(25, $44\tau_n$)
(12.5, $88\tau_n$)



note Scaled by 10