

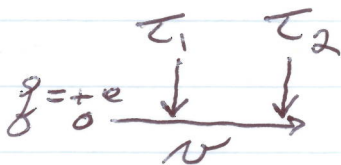
Phy 3805 Fall, 2009

Quiz #2 Solutions

1)  $\Delta\tau = 1 \text{ sec}$

$v_1 = 0.9c$

$v_2 = 0.9999999c$



$\Delta\tau = \tau_2 - \tau_1$

Force =  $F = \frac{dp}{dt}$  (i.e.  $F=ma$  is not valid in Relativity)

Since constant acceleration,

$F = \frac{\Delta p}{\Delta\tau} = \frac{\gamma_2 m_p v_2 - \gamma_1 m_p v_1}{1 \text{ sec.}}$

$= \frac{1.7 \times 10^{-27} \text{ kg}}{1 \text{ s}} \left[ \frac{0.9999999c}{\sqrt{2 \times 10^{-6}}} - \frac{0.9c}{\sqrt{0.19}} \right]$

$F = 2.5 \times 10^{-16} \text{ N}$