Ch. 36 – 13

13. (II) Suppose a news report stated that starship *Enterprise* had just returned from a 5-year voyage while traveling at $0.74c$. (*a*) If the report meant 5.0 years of *Earth time*, how much time elapsed on the ship? (*b*) If the report meant 5.0 years of *ship time*, how much time passed on Earth?

Ch. 36 – 13

a) $\Delta t = \dfrac{\Delta t_0}{\sqrt{1 - v^2/c^2}}$ Eq. 36-1a

$\Delta t_0 = \Delta t\sqrt{1 - v^2/c^2} = (5\ \text{yr})\sqrt{1 - (0.74)^2} = 3.4\ \text{yr}$

b) $\Delta t = \dfrac{\Delta t_0}{\sqrt{1 - v^2/c^2}} \rightarrow \quad \Delta t = \dfrac{5\ \text{yr}}{\sqrt{1 - (0.74)^2}} = 7.4\ \text{yr}$