30. (a) Replacing differentials with deltas in Eq. 43-11, we use the fact that $\Delta N = -12$ during $\Delta t = 1.0$ s to obtain

$$\frac{\Delta N}{N} = -\lambda \Delta t \quad \Longrightarrow \quad \lambda = 4.8 \times 10^{-18}/\text{s}$$

where $N = 2.5 \times 10^{18}$, mentioned at the second paragraph of §43-3, is used.

(b) Eq. 43-17 yields $T_{1/2} = \ln 2/\lambda = 1.4 \times 10^{17}$ s, or about 4.6 billion years.