

28. Our approach is the same as that shown in Sample Problem 44-3. We have

$$\frac{N_5(t)}{N_8(t)} = \frac{N_5(0)}{N_8(0)} e^{-(\lambda_5 - \lambda_8)t} ,$$

or

$$\begin{aligned} t &= \frac{1}{\lambda_8 - \lambda_5} \ln \left[\left(\frac{N_5(t)}{N_8(t)} \right) \left(\frac{N_8(0)}{N_5(0)} \right) \right] \\ &= \frac{1}{(1.55 - 9.85)10^{-10} \text{ y}^{-1}} \ln [(0.0072)(0.15)^{-1}] = 3.6 \times 10^9 \text{ y} . \end{aligned}$$