

4-53

$$A_0 = 120 \text{ Bq}$$

$$A = 110 \text{ Bq}$$

$$t = 45 \text{ d}$$

$$A = A_0 e^{-\lambda t} = A_0 e^{-\frac{\ln 2}{T_{1/2}} \cdot t}$$

$$A = A_0 e^{-\frac{\ln 2}{T_{1/2}} \cdot t}$$

 $\left| / A_0 \right.$

$$\frac{A}{A_0} = e^{-\frac{\ln 2}{T_{1/2}} \cdot t}$$

 $\left| \ln \right.$

$$\ln \frac{A}{A_0} = \ln \left(e^{-\frac{\ln 2}{T_{1/2}} \cdot t} \right)$$

$\ln e = 1$

$$\ln \frac{A}{A_0} = -\frac{\ln 2}{T_{1/2}} \cdot t \cdot 1$$

$$T_{1/2} = -\frac{\ln 2 \cdot t}{\ln \frac{A}{A_0}} = -\frac{\ln 2 \cdot 45 \text{ (d)}}{\ln \frac{110 \text{ Bq}}{120 \text{ Bq}}}$$

$$T_{1/2} \approx \underline{\underline{358 \text{ d}}}$$