

36. (a) We use $R = R_0 e^{-\lambda t}$ to find t :

$$t = \frac{1}{\lambda} \ln \frac{R_0}{R} = \frac{T_{1/2}}{\ln 2} \ln \frac{R_0}{R} = \frac{14.28 \text{ d}}{\ln 2} \ln \frac{3050}{170} = 59.5 \text{ d} .$$

(b) The required factor is

$$\frac{R_0}{R} = e^{\lambda t} = e^{t \ln 2 / T_{1/2}} = e^{(3.48 \text{ d} / 14.28 \text{ d}) \ln 2} = 1.18 .$$