Section 10.5

1. The coefficient of $e$ is 1; this is the initial value. In one half-life there is one-half of the initial value left. Thus we are trying to solve the equation, $\frac{1}{2} = e^{-0.0157x}$.

\[
\ln \left( \frac{1}{2} \right) = \ln(e^{-0.0157x})
\]

\[
\ln \left( \frac{1}{2} \right) = -0.0157x
\]

\[
\ln \left( \frac{1}{2} \right) = x
\]

\[
-0.0157 = x
\]

\[
44.15 \approx x
\]

The half life for this material is approximately 44.15 years.