Q6 Prep vol

(13) $A = A_0 e^{kt}$

when $t = 0$, $A_0 = 1800$
when $t = 8$, $A = 700$, so

$700 = 1800 e^{k(8)}$

$\frac{700}{1800} = e^{8k}$

$\ln\left(\frac{7}{18}\right) = \ln(e^{8k})$

$\ln\left(\frac{7}{18}\right) = 8k \ln(e)$

$\ln\left(\frac{7}{18}\right) = 8k$

$\frac{\ln\left(\frac{7}{18}\right)}{8} = k$

$k \approx -.11805\,77011$

$A = A_0 e^{kt}$ when $A = 100$ what is $t$?

$100 = 1800 e^{kt}$

$\frac{100}{1800} = e^{kt}$

$\ln\left(\frac{1}{18}\right) = kt$

$\frac{\ln\left(\frac{1}{18}\right)}{k} = t$

$t = \frac{\ln\left(\frac{1}{18}\right)}{-.11805\,77011}$

$t = 24.48270406$ yrs
From initial time.
Now is 8 yrs Later
So: $24.48270406 - 8$

ANSWER → $16.48270406$ yrs from now