HW solutions to 4.8 #2: 19, 29

19.) $\frac{1/2A_0}{A_0} = \frac{A_0 e^{kt}}{A_0}$

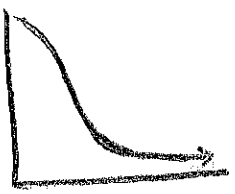
$\frac{1}{2} = e^{k(8)} \rightarrow \frac{1}{2} = e^{8k} \rightarrow \ln\left(\frac{1}{2}\right) = \ln e^{8k}$

$\frac{\ln\left(\frac{1}{2}\right)}{8} = \frac{8k}{8} \rightarrow \boxed{\frac{\ln\left(\frac{1}{2}\right)}{8} = k}$

$0.1 = e^{\frac{\ln\left(\frac{1}{2}\right)}{8}(t)} \rightarrow \ln(0.1) = \ln e^{\frac{\ln\left(\frac{1}{2}\right)}{8}t}$

$\frac{\ln(0.1)}{\frac{\ln\left(\frac{1}{2}\right)}{8}} = \frac{\frac{\ln\left(\frac{1}{2}\right)}{8}t}{\frac{\ln\left(\frac{1}{2}\right)}{8}} \rightarrow \boxed{t \approx 26.6 \text{ days}}$

29.) a.) graph in your calculator
use Zoom : STAT



b.) 2nd Trace → value → 15 → Enter : **78.06%** is the probability that no 2 people, in a room of 15 people, share the same birthday.

c.) $10 = \frac{113.3198}{1 + 0.115e^{0.0912n}}$

- Put 10 in y_2, graph, 2nd Trace → Intersect

About **50 people**

d.) As n increases, the probability that NO 2 people share the same b-day gets closer to Zero.