Exponential & Logs - Solving Log Equations Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

A2RCC U3D7 Word Problems

Use the reference table to the right to assist you in answering questions 1-5.

$$Half-Lifes$$

$$As-81=33seconds$$

$$Au-198=2.69 days$$

$$C-14=5730 years$$

1. Approximately how many seconds does it take a 100g sample of As-81 to decay to 6.25g?
2. Approximately how many days does it take a 180g sample of Au-198 to decay to $^{1}/\_{8}$ its original mass?
3. What percent*, to the nearest hundredth of a percent*, of a sample of As-81 remains un-decayed after 43.2 seconds?
4. What is the half-life of a radioactive isotope if a 500g sample decays to 62.5g in 24.3 hours?
5. Approximately how old is a bone if it presently contains 0.3125gof C-14, but it was estimated to have originally contained 80g of C-14?
6. On average, college seniors graduating in 2012 could compute their growing student loan debt using the function $D\left(t\right)=29,400(1.068)^{t}$, where $t$ is time in years. Which expression is equivalent to $29,400(1.068)^{t}$ and could be used by students to identify an approximate daily interest rate on their loans?
7. $29,400\left(1.068^{\frac{1}{365}}\right)^{t}$
8. $29,400\left(\frac{1.068}{365}\right)^{365t}$
9. $29,400\left(1+\frac{1.068}{365}\right)^{t}$
10. $29,400\left(1.068^{\frac{1}{365}}\right)^{365t}$
11. 

**Explain your choice.**



1.
2. Angie found that the number of white-winged crossbills in an area can be represented by the formula$ C=550(1.08)^{t}$, where $t$ represents the number of years since 2010. Which equation correctly represents the number of white-winged crossbills in terms of the monthly rate of population growth?
3. $C=550(1.00643)^{t}$ (3) $C=550(1.00643)^{\frac{t}{12}}$
4. $C=550(1.00643)^{12t}$ (4) $C=550(1.08)^{12t}$



1.
2. Grace pays a $712 premium for house loan. If the premium increases at an annual rate of 6% compounded quarterly, how many years will it take for the premium to be $898.90?