

Tuesday January 10, 2012
 #10#34 (LAST ONE)
 Aim: How do we solve logarithmic equations?
 1/12/12: Notebook, textbook, folder, Final Exam, Project

Do Now: Use the equation $A_n = A_0 e^{rt}$

The element FERMIUM has a decay constant of -0.00866 PER DAY. After how many days will 7 grams remain of a 10 gram sample? (use natural logs to solve) $\Rightarrow \ln$

A_0 = initial amount
 A_n = final amount
 r = constant

$A_n = A_0 e^{rt}$
 $7 = 10 e^{-0.00866t}$

USE NATURAL LOGS TO SOLVE FOR t :

$\ln 7 = \ln 10 + \ln e^{-0.00866t}$
 $\ln 7 = \ln 10 - 0.00866t \ln e$

$\ln 7 - \ln 10 = -0.00866 \cdot \ln e \cdot t$
 $\frac{\ln 7 - \ln 10}{-0.00866 \cdot (-1)} = t$
 $41 = t$
 days.

$\ln e = ? = 1$
 base = e
 Answer = e
 $e^1 = e$

Jan 10-8:24 AM

② If a \$100 investment receives a 5% interest each year, after how many years will the investment have double in value?

USE THE FORMULA: $A = P(1+r)^t$

P = initial investment $\rightarrow 100$
 A = final amount $\rightarrow 200$
 r = % 5% = 0.05
 t = ? (time)

$200 = 100(1+0.05)^t$
 Let's use logs
 $\log 200 = \log 100 + \log 1.05^t$
 $\log 200 = \log 100 + t \log 1.05$
 $\log 200 - \log 100 = t$
 $\log 1.05$

15 years $\approx t$

Jan 10-10:03 AM