Exponential Models

"Increase at 5% a year"

INVEST $100 w/ 5% simple interest

5% x100 = $5
100% 100 $100
105% x100 $105

$100 (1.05)(1.05) = 110.25 Two years.

↑ interest on interest

$100 (1.05)^2$

after n years.

$100 (1.05)^n$ ← exponential

Compound Interest Form

$$P = Q\left(1 + \frac{R}{N}\right)^{NT}$$

P = ENDING AMOUNT
Q = STARTING AMOUNT
R = Interest RAT
T = TIME
N = 2 (Semi-annual) 4 (Quarterly) 12 (Monthly) 365.

Ex "CD" pays 6 mos $10,000 1.050%

Compound monthly

P =

Q = 10,000

R = 1.050% = .01050 per year

T = 6 mos / 12 = 1/2 year

N = 12

$$P = 10000\left(1 + .0105/12\right)^{(12 * 1/}$$

$$= 10052.61$$

Compounded Hourly

$$P = Q\left(1 + R/8760\right)^{8760 \cdot T}$$

close to zero

close to 1

Raise 8760

Compounded ↓ Continuously

$$P = Q\left(1 + \frac{R}{\infty}\right)^{\infty \cdot T}$$

↓

$$P = Q\, e^{RT}$$

Natural Exponent 2.71...

[Math] 0:

Solver

$0 = P - Q e \wedge (RT)$

$P = 10000$

$Q = 1200$

$R = ?$ <alpha> <enter> = .0815

$T = 26$

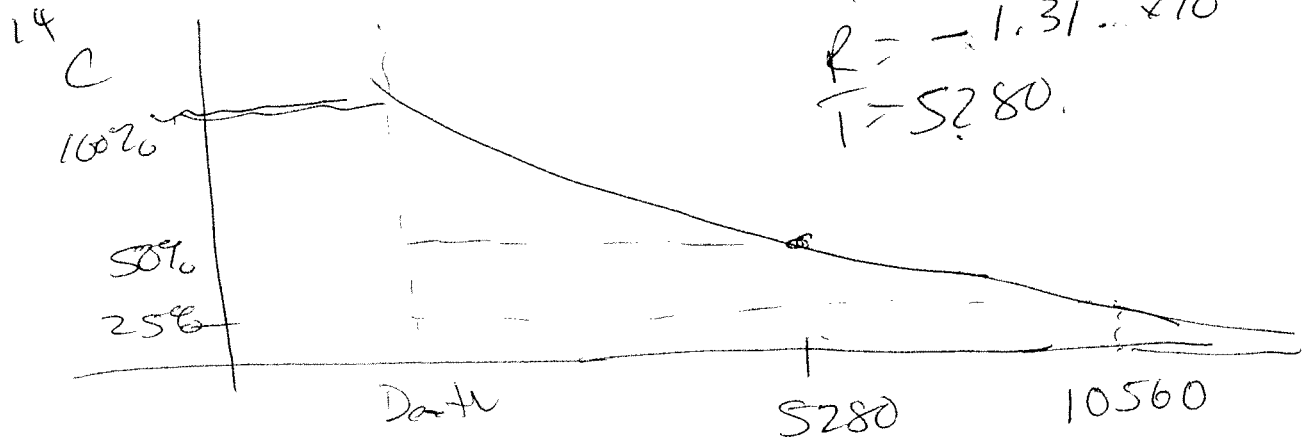
Carbon Dating

$P = 50$ "Half Life"

$Q = 100$

$R = -1.31\ldots \times 10^{-4}$

$T = 5280.$



$P = ?$

$Q = 100$

$R = -1.31\ldots$

$T = 10560$

How old if ^{14}C is at 1%

$P = 1$

$\Theta = 100$

$R = -1.3(\ldots$

$T = ?$ $35079.56\ldots$