Sheet #552 = NOTES ON

EXPONENTIAL MODELS

t = TIME IN YEARS.
A = INITIAL (PRINCIPAL) AMOUNT
r = ANNUAL INTEREST RATE / 100%.

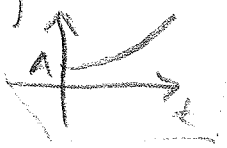
1. a, COMPOUNDED.

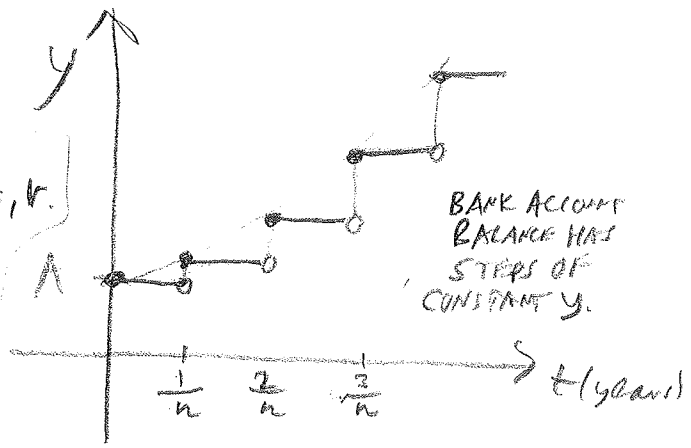
$$y = A\left(1 + \frac{r}{n}\right)^{nt}$$

COMPOUNDED n TIMES PER YEAR.
TOTAL PAYMENT = nt.

b, CONTINUOUS, GIVEN ANNUAL RATE, r.

$$y = A(1+r)^t$$





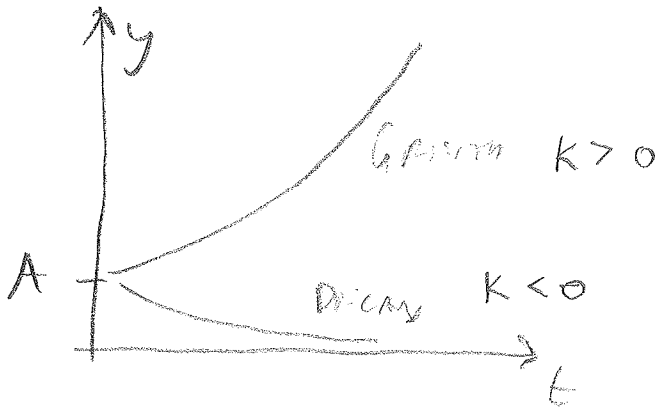
BANK ACCOUNT BALANCE HAS STEPS OF CONSTANT y.

2. EXP. GROWTH / DECAY

$$y = Ae^{kt}$$

k = CONTINUOUS EXPONENTIAL DECAY GROWTH RATE CONSTANT

THIS MODEL CAN ALWAYS BE USED FOR CONTINUOUS GROWTH & DECAY.

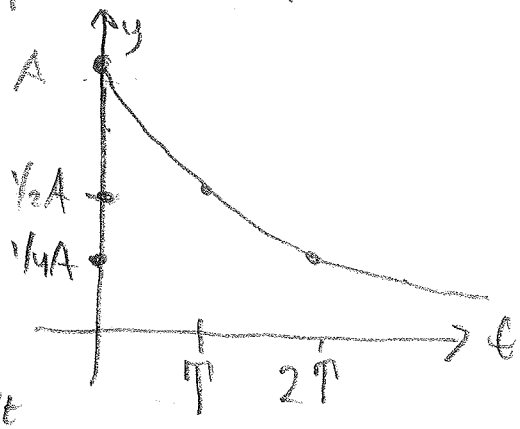


3. DECAY.

$$y = A\left(\frac{1}{2}\right)^{t/T}$$

T = half life
t/T = # of half lives.

THIS MODEL IS ALSO CONTINUOUS, USEFUL FOR HALF LIFE.



4. GROWTH $y = A(2)^{t/T}$

T = doubling time.