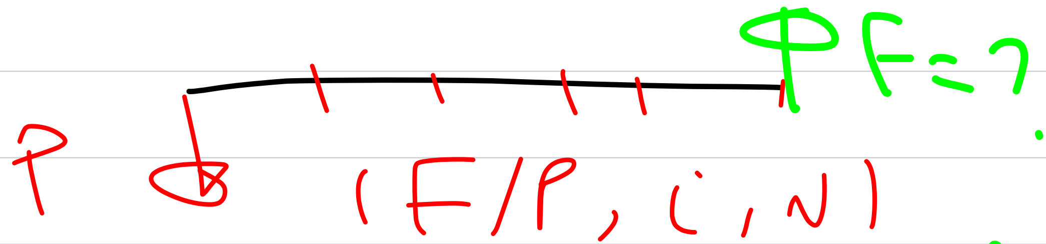
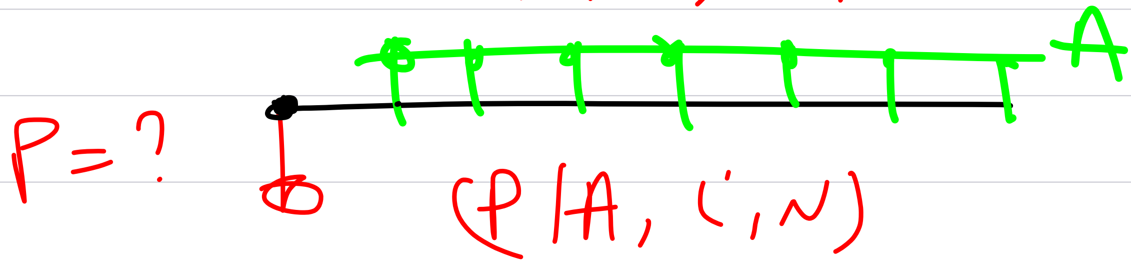
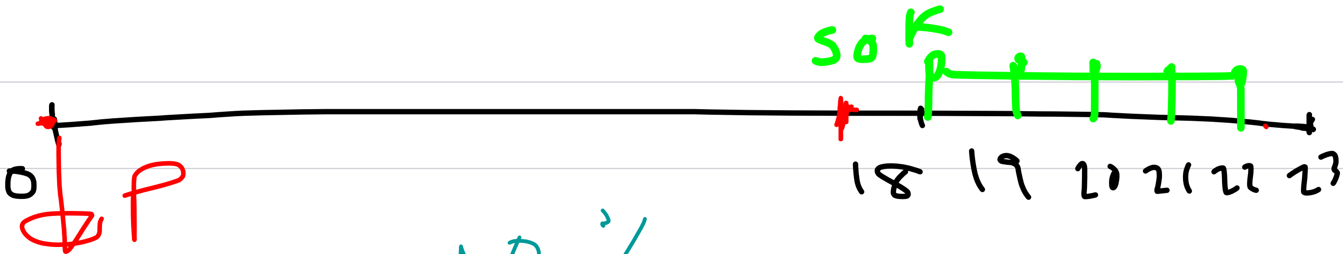
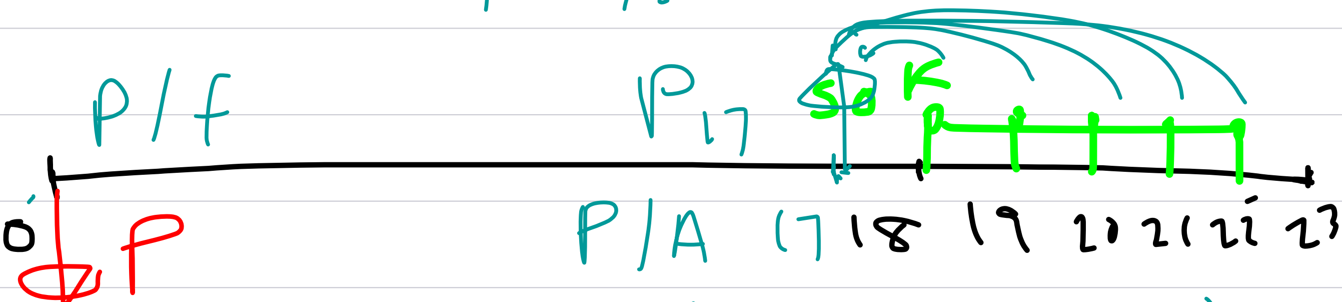
July 8th 2014







10%



$$P_{17} = 50K(P/A, 10\%, 5)$$

$$P = P^F_{17}(P/F, 10\%, 17)$$

$$= 50K(P/A, 10\%, 5)(P/F, 10\%, 17)$$

$$= 50K\left(\frac{1}{(1+.10)^{5}}\right)$$

$$F = P(1+i)^N$$

When your investment will Double

$$F = 2P$$

$$2\not{P} = \not{P}(1+i)^N$$

$$(1+i)^N = 2$$

Rule of 72 is approx.

$i = \frac{72}{N}$ or $N = \frac{72}{i}$

where i is not decimal

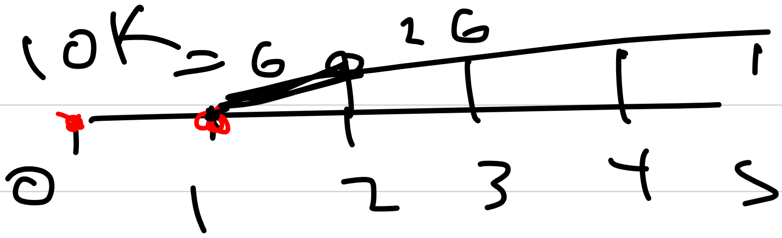
$N = 10$ yr to Double

$i = ?$

$$i = \frac{72}{10} = 7.2\%$$

$i = 10\%$, $N = ?$ to Double

$$N = 72/10 = 7.2 \text{ yrs}$$

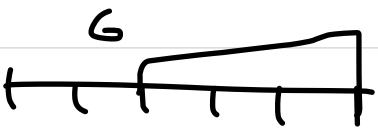


$i = 10\%$

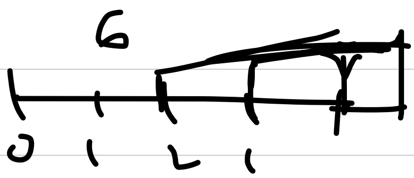
$(P/G, i, n) = 6.862$

$10\%, 5$

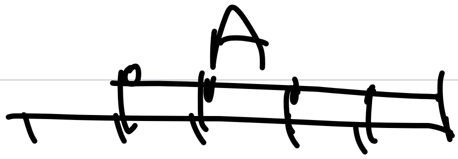
$P = 10K(6.862) = 68620$



=



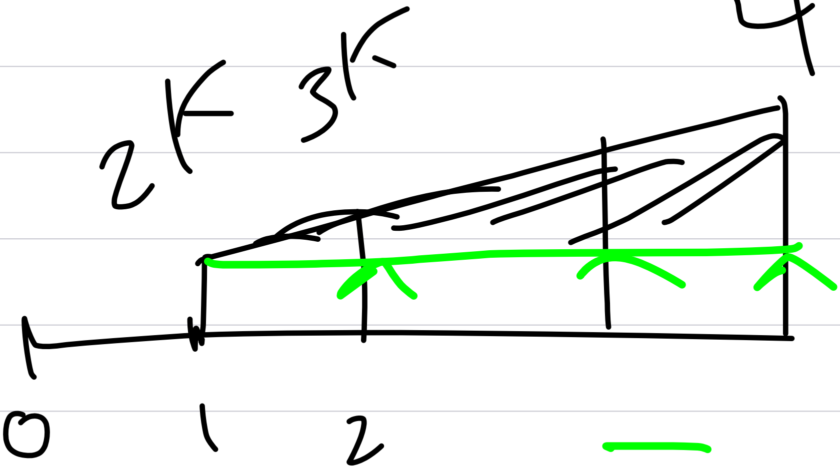
=

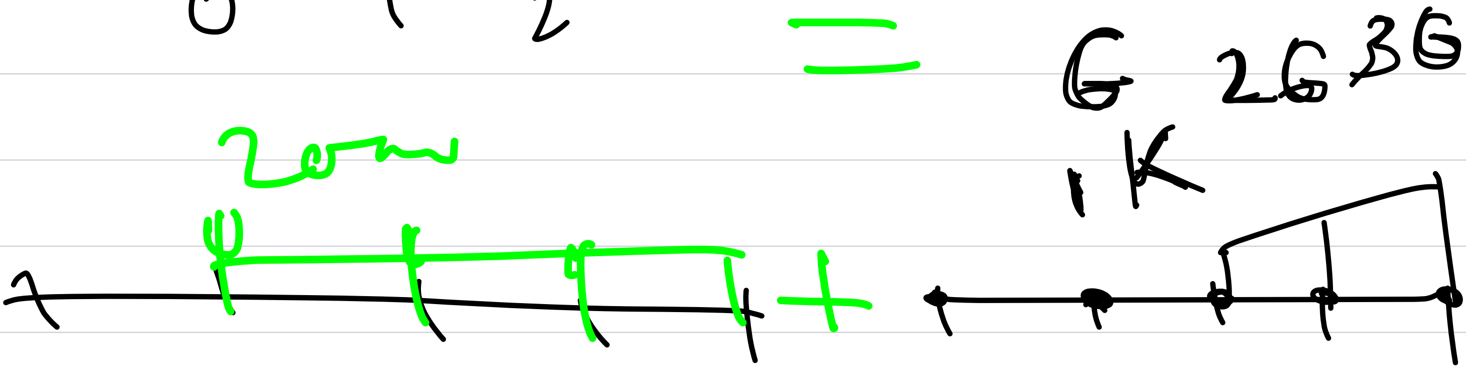


$A = G(A/G, 10\%, 5) = 10K \times 1.8101$

$= 18101.00$

1	2000
2	3000
3	4000
4	5000





$P = 2^K(P|A, 8\%, 4) + 1^K(P/G, 8\%, 4)$

$A = 2^K + 1^K(A/G, 8\%, 4)$

$F = 2^K(F|A, 8\%, 4) + 1^K(F/G, 8\%, 4)$

Nominal vs Effective

$i = 12\%$ ← Nominal APR

Comp. Freq	$F = ?$	i effective
yearly	$F = 1000(1+.12)^1 = 1120$	$\frac{1120-1000}{1000} = 12\%$
Semi A.	$F = 1000\left(1+\frac{.12}{2}\right)^{2} = 1123.60$	$i_{eff} = \frac{1123.60-1000}{1000} = 12.36\%$
QTR.	$F = 1000\left(1+\frac{.12}{4}\right)^{4} = 1125.50$	$i_{eff} = \frac{1125.50-1000}{1000} = 12.55\%$
Monthly	$F = 1000\left(1+\frac{.12}{12}\right)^{12} = 1126.8$	$i_{eff} = \frac{1126.8-1000}{1000} = 12.68\%$
Wkly	$F = 1000\left(1+\frac{.12}{52}\right)^{52} = 1127.3$	$i_{eff} = \frac{1127.3-1000}{1000} = 12.73\%$

Cont. Compounding

$F = 1000\left(e^{rN}\right)$ where r = Cont Comp Rate

$F = 1000\left(e^{(.12)(1)}\right) = 1000(1.127) = 1127$

$i_{eff} = \frac{1127.5-1000}{1000} = 12.75\%$

$F = P\left(1+\frac{i}{m}\right)^m$

$i_{eff} = \frac{F-P}{P} = \frac{P\left(1+\frac{i}{m}\right)^m - P}{P} =$

$= \left(1+\frac{i}{m}\right)^m - 1$

12% comp @ Qtrly

i_{eff} yr $= \left(1+\frac{.12}{4}\right)^4 - 1$

$= 12.55\%$

i_{eff} 6 month $= \left(1+\frac{.12}{4}\right)^2 - 1$

$\frac{.06}{2}$ $= 6.09\%$

With an interest rate of 8% compounded ~~semiannually~~ monthly, the value of a $1,000 investment after 5 years is near:

$F = 1000\left(1+\frac{.08}{2\ (12)}\right)^{10\ (60)} =$

$F = 1000(1+?)^5$ Comp Monthly

Maintenance costs of a machine are expected to be zero for the first 4 years, $2000 in year 5, $2500 in year 6, and amounts increasing by $500 each year through year 10. At an interest rate of 8% per year, the value of *n* to use in the *P*/*G* equation for this problem:

$F = 1000(1 + i_{eff})^5$

$= 1000\left(\left(1 + \frac{.08}{12}\right)^{12}\right)^5$

$= 1000\left(1 + \frac{.08}{12}\right)^{5 \times 12}$

$= 1000\left(1 + \frac{.08}{12}\right)^{60}$

$e^{(.02)2} - 1$

For an interest rate of 2% per quarter, compounded continuously, the effective semiannual interest rate is:

$F = P e^{rn}$ $\quad P = 1000$ in

$R = 12\%$

$F = 1000 e^{.12(1)} = 1000(1.127)$

$(F/P, r, n) = 1.127$

$i_{eff} = 1.127 - 1 = .127$

8% i_{ann} 4% per Sem i

For an interest rate of 2% per quarter, compounded ~~continuously~~ monthly, the effective semiannual interest rate is:

1. QTRly
2. Semiannual
3. Annual

$i_{eff} = \left(1 + \frac{i}{m}\right)^m - 1$

$i_{eff\,qtr} = \left(1 + \frac{.02}{3}\right)^3 - 1$

$i_{eff\,Semi} = \left(1 + \frac{.02}{3}\right)^6 - 1$

$i_{eff\,annual} = \left(1 + \frac{.02}{3}\right)^{12} - 1$

$i_{eff\,ann} = \left(1 + ?\right)^4 - 1$

$= \left(1 + \left(1 + \frac{.02}{3}\right)^3 - 1\right)^4 - 1$

$= \left(1 + \frac{.02}{3}\right)^{12} - 1$