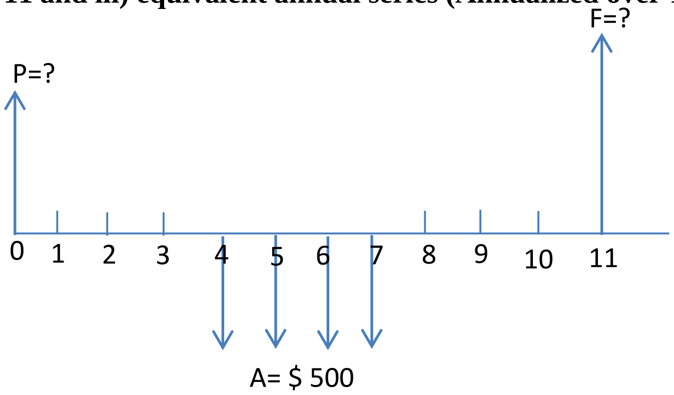
Second tutorial

1- For the following uniform-series amounts determine: i) the present value ii) the future value in year 11 and iii) equivalent annual series (Annualized over 11 years) (*i*= %8).



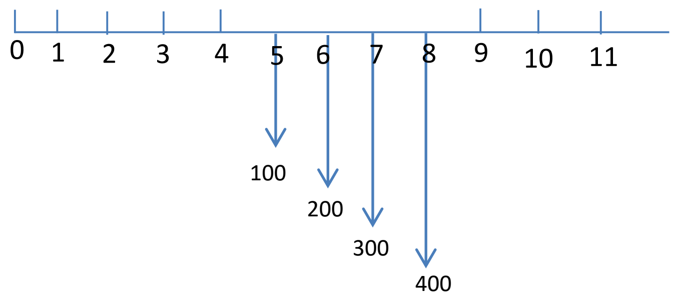
i) P = 500 (P/A, 8%, 4) * (P/F, 8%, 3) = 500*3.3121*0.7938 = $ 1,314.57

ii) First way: F = P (F/P, 8%, 11) = 1,314.57*2.3316 = $ 3,065

Second way: F = 500 (F/A, 8%, 4) * (F/P, 8%, 4) = 500*4.5061*1.3605 = $ 3,065

iii) A = 1,314.57 (A/P, 8%, 11) = 3,065 (A/F, 8%, 11) = $ 184.14

2- Annualize the following cash flow over 11 years (*i*= %10).



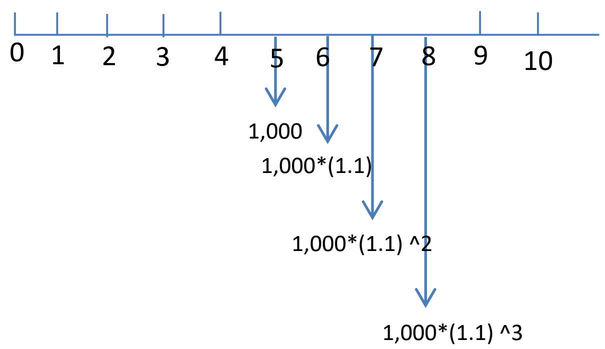
The present value of the Arithmetic Gradient will always be located two periods before the gradient starts (at year 4):

P_4 = 100(P/A, 10%, 4) + 100(P/G, 10%, 4) = 754.8

P_0 = 754.8(P/F, 10%, 4) = 515.5

A = 515.5(A/P, 10%, 11) = 79.4

3- Annualize the following cash flow over 10 years (*i*= %15).



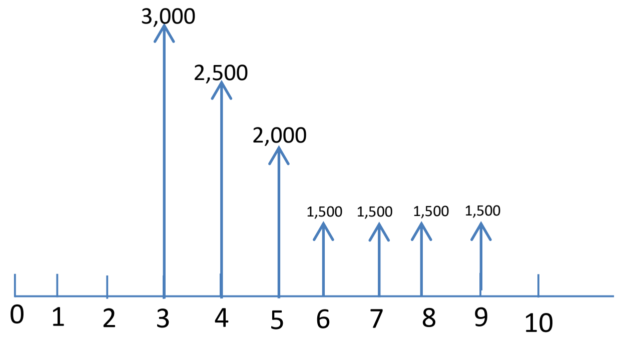
$P_g = A\ (P/A, g\%, i\%, n) = 1{,}000\ (P/A, 10\%, 15\%, 4) = 1{,}000*3.258 = 3{,}258$

Since $i \neq g$, $(P/A, 10\%, 15\%, 4) = \frac{1-\left(\frac{1+g}{1+i}\right)^{\wedge}n}{i-g} = \frac{1-\left(\frac{1+0.1}{1+0.15}\right)^{\wedge}4}{0.15-0.1} = 3.258$

$P_0 = 3{,}258\ (P/F, 15\%, 4) = 1{,}863$

$A = 1{,}863\ (A/P, 15\%, 10) = 371$

4- Annualize the following cash flow over 10 years (*i*= %8).



P_G = the present value of arithmetic gradient = [3000 (P/A, 8%, 4) – 500 (P/G, 8%, 4)] * (P/F, 8%, 2) = 6525

P_A = the present value of uniform-series amounts = 1500(P/A, 8%, 3) * (P/F, 8%, 6) = 2436

$P_T = P_G + P_A = 6525 + 2436 = 8961$

$A = 8961\ (A/P, 8\%, 10) = 1335$