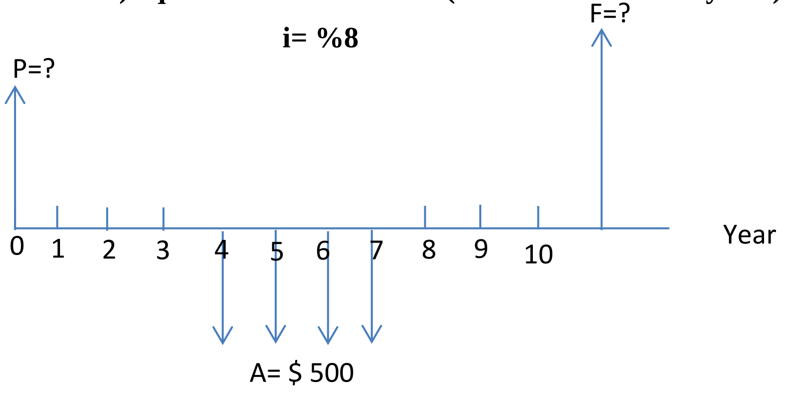
Third tutorial

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).**



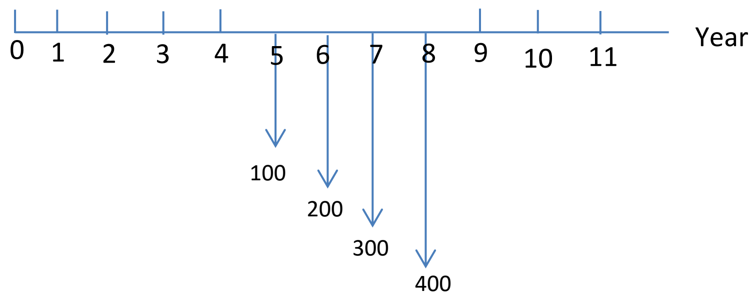
i) P = 500 (P/A, 8%, 4) * (P/F, 8%, 3) = 500*3.3121*0.7938 = $ 1,314.57

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).



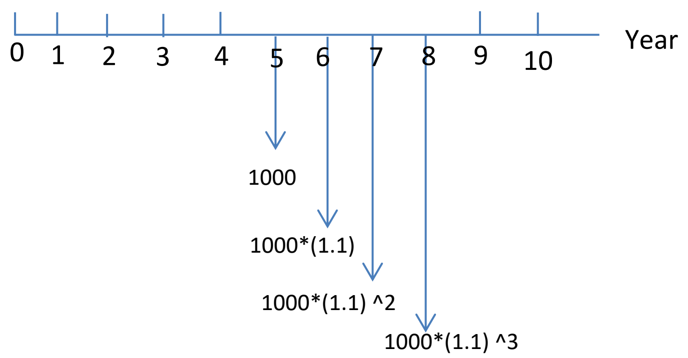
The present value of the Arithmetic Gradient will always be located two periods before the gradient starts (at year 4):

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).



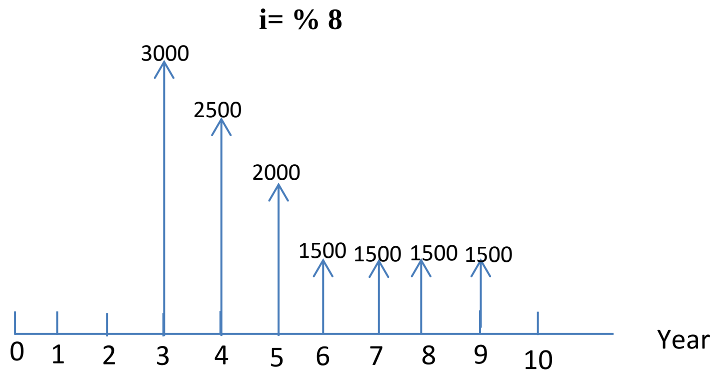
$P_4 = D\ (P/A,\ E\%,\ i\%,\ n) = 1{,}000\ (P/A,\ 10\%,\ 15\%,\ 4) = 1000*3.258 = 3{,}258$

$(P/A,\ 10\%,\ 15\%,\ 4) = \frac{1}{E-i} * [\frac{(1+E)^n}{(1+i)^n} - 1] = \frac{1}{0.1-0.15} * [\frac{(1+0.1)^4}{(1+0.15)^4} - 1] = 3.258$

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

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 = [3,000 (P/A, 8%, 4) – 500 (P/G, 8%, 4)] * (P/F, 8%, 2) = 6,525

P_{A} = the present value of uniform-series amounts = 1,500(P/A, 8%, 3) * (P/F, 8%, 6) = 2,436

$P_T = P_G + P_A = 6{,}525 + 2{,}436 = 8{,}961$

A = 8,961 (A/P, 8%, 10) = 1,335