INDE 301 - Quiz N°1

1) $F = A \times (F|A, i, n)$

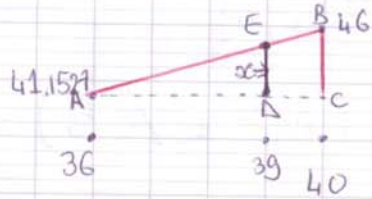
$F = 1300 \times (F|A, 0.75\%, 39)$

a) Find F|A using interpolation

Tables $(F|A, 0.75\%, 36) = 41.1527$

$(F|A, 0.75\%, 39) = ?$

$(F|A, 0.75\%, 40) = 46.4465$



$\triangle ABC$ and $\triangle EDA$ are similar

$$\frac{ED}{BC} = \frac{AD}{AC}$$

$$\frac{x}{46.4465 - 41.1527} = \frac{39-36}{40-36} = \frac{3}{4}$$

1.5 → Interpolation

$4x = 3 \times 5.2938 = 15.8814 \Rightarrow x = 3.97035$

$\Rightarrow (F|A, 0.75\%, 39) = 41.1527 + x = 41.1527 + 3.97035$

$(F|A, 0.75\%, 39) = 45.12305$

$F = 1300 \times 45.12305 = 58659.965$ ~~$

b) Find F|A using formula

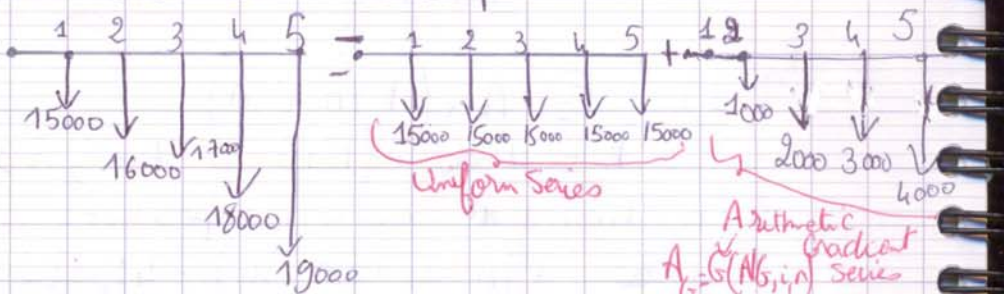
$$(F|A, 0.75\%, 39) = \frac{(1+i)^n - 1}{i} = \frac{(1+0.75\%)^{39} - 1}{0.75\%}$$

$(F|A, 0.75\%, 39) = 45.1081$

0.25 → Formula

$\Rightarrow F = 1300 \times 45.1081 = 58640.62$ ~~$

2) We Draw the Cash flow the we decompose



(2)

Find the Equivalent Annual worth of the maintenance costs

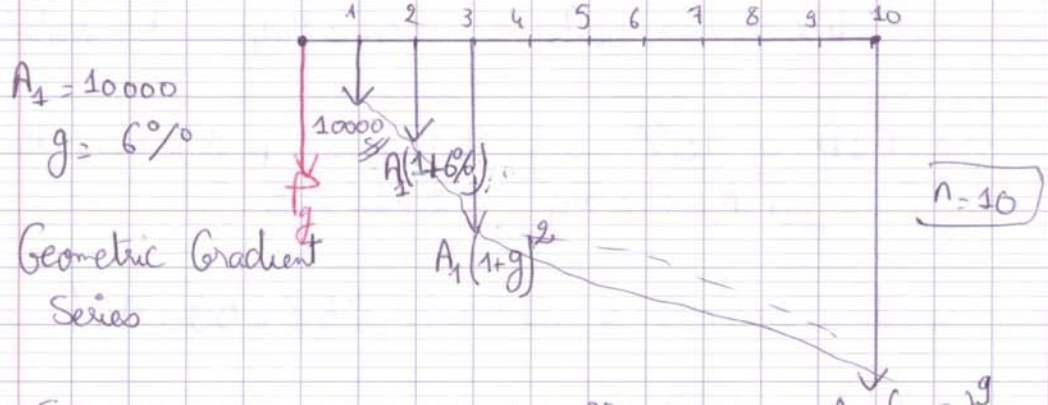
$$A = 15000 + G(A/G, i, n)$$

$$(A/G, 10\%, 5) = \frac{1}{i} - \frac{n}{(1+i)^n - 1} = 1.8101$$

$$= 15000 + 1000(A/G, 10\%, 5)$$

$$A = 15000 + 1000 \times 1.8101 = 16810.1 \$$$

3) Cash flow:



(1.25)

Find the present worth: $i = 12\% \neq g$

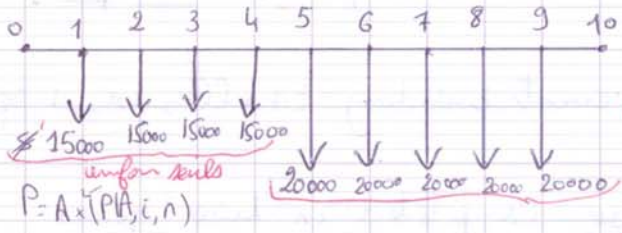
$$P_g = A_1 \left\{ \left[1 - \left(\frac{1+g}{1+i} \right)^n \right] / (i - g) \right\}$$

$$P_g = 10000 \left[\frac{1 - \left(\frac{1+6\%}{1+12\%} \right)^{10}}{(12\% - 6\%)} \right] = 10000 \times 7.05658$$

$$= 70565.8284$$

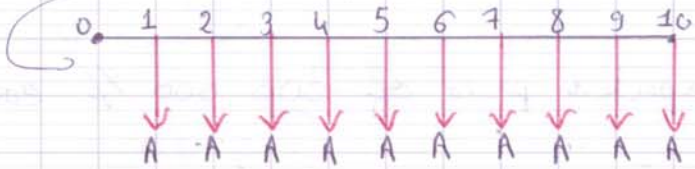
$$P_g = \$70565.82848$$

4) Given Cash Flow is:



$P = A \times (P|A, i, n)$

Find the equivalent annual worth (in year 1 thru 10)



We should Find A

First step: we find the present worth of the initial cash flow

+0.25 → $P = 15000 \times (P|A, 10\%, 4) + 20000 \times (P|A, 10\%, 5) \times (P|F, 10\%, 4)$

$P = 15000 \times 3.1699 + 20000 \times 3.7908 \times 0.6830$

$= 47548.5 + 51782.328$

$P = \$99330.828$

Find A: $A = P \times (A|P, i, n)$

$A = P \times (A|P, 10\%, 10)$

$A = 99330.828 \times 0.16275$

Bonus:

+0.25 → $A = 16166.092$ $