Anexo 4

RESPUESTAS

GRADIENTES ARITMÉTICOS

PROBLEMA 1.-

VALOR FUTURO

Los pagos forman una sucesión aritmética, en donde la cantidad base es $1,300.00 y el gradiente es igual a $200.00.

Datos:
R_P=$1,300.00
G_a=$200.00
n=12
i=30% anual =30/12=2.5% mensual

$$M_{ga} = \left(Rp_1 + \frac{g_a}{i/m}\right)\left[\frac{(1 + i/m)^n - 1}{i/m}\right] - \frac{n * g_a}{i/m}$$

Sustitución de Valores en la Fórmula:

$$M_{ga} = \left(\$1{,}300.00 + \frac{\$200.00}{0.025}\right)\left[\frac{(1 + 0.025)^{12} - 1}{0.025}\right] - \frac{12 * \$200.00}{0.025}$$

$$M_{ga} = (\$1{,}300.00 + \$8{,}000.00)\left[\frac{(1.025)^{12} - 1}{0.025}\right] - \frac{\$2{,}400.00}{0.025}$$

$$M_{ga} = (\$9{,}300.00)\left[\frac{1.344888824 - 1}{0.025}\right] - \$96{,}000.00$$

$$M_{ga} = (\$9{,}300.00)\left[\frac{0.344888824}{0.025}\right] - \$96{,}000.00$$

$$M_{ga} = (\$9{,}300.00)[13.79555297] - \$96{,}000.00$$

$$M_{ga} = \$128{,}298.64 - \$96{,}000.00$$

$$M_{ga} = \$32{,}298.64$$

VALOR ACTUAL

Datos:
R_P=$1,300.00
G_a=$200.00
n=12
i=30% anual =30/12=2.5% mensual

$$VA_{ga} = \left[\left(Rp_1 + \frac{g_a}{i/m}\right)\left[\frac{(1+i/m)^n - 1}{i/m}\right] - \frac{n * g_a}{i/m}\right](1+i/m)^{-n}$$

$$VA_{ga} = \left[\left(\$1{,}300 + \frac{\$200.00}{0.025}\right)\left[\frac{(1+0.025)^{12} - 1}{0.025}\right] - \frac{12 * \$200.00}{0.025}\right](1+0.025)^{-12}$$

$$VA_{ga} = \left[(\$1{,}300.00 + \$8{,}000.00)\left[\frac{(1.025)^{12} - 1}{0.025}\right] - \frac{\$2{,}400.00}{0.025}\right](1.025)^{-12}$$

$$VA_{ga} = \left[(\$9{,}300.00)\left[\frac{1.344888824 - 1}{0.025}\right] - \$96{,}000.00\right](0.743555885)$$

$$VA_{ga} = \left[(\$9{,}300.00)\left[\frac{0.344888824}{0.025}\right] - \$96{,}000.00\right](0.743555885)$$

$$VA_{ga} = [(\$9{,}300.00)[13.79555297] - \$96{,}000.00](0.743555885)$$

$$VA_{ga} = [\$128{,}298.64 - \$96{,}000.00](0.743555885)$$

$$VA_{ga} = (\$32{,}298.64)(0.743555885)$$

$$VA_{ga} = \$24{,}015.85$$

PROBLEMA 2.-

VALOR FUTURO

Datos:

n = 30 mensualidades

Mg_a=?

i= 35% cap. mensual

R_p=$4,200.00

g_a = $1,500.00

$$Mga = (Rp_1 + \frac{ga}{i/m})\left[\frac{(1+i/m)^n - 1}{i/m}\right] - \frac{n * ga}{i/m}$$

$$Mga = (\$4{,}200.00 + \frac{\$1{,}500.00}{.35/12})\left[\frac{(1+.35/12)^{30} - 1}{.35/12}\right] - \frac{30 * \$1{,}500.00}{.35/12}$$

$$Mga = (\$4{,}200.00 + \frac{\$1{,}500.00}{.029166666})\left[\frac{(1+.029166666)^{30} - 1}{.029166666}\right] - \frac{\$45{,}000.00}{.029166666}$$

$$Mga = (\$4{,}200.00 + \$51{,}428.5726)\left[\frac{(1.029166666)^{30} - 1}{.029166666}\right] - \$1{,}542{,}857.178$$

$$Mga = (\$4{,}200.00 + \$51{,}428.5726)\left[\frac{1.369034242}{.029166666}\right] - \$1{,}542{,}857.178$$

$$Mga = \$55{,}628.5726\left[46.93831794\right] - \$1{,}542{,}857.178$$

$$Mga = \$2{,}611{,}111.627 - \$1{,}542{,}857.178$$

$$Mga = \$1{,}068{,}254.449$$

VALOR ACTUAL

Datos:

n = 30 mensualidades
Mg_a= $1,068,254.449
i= 35% cap. mensual
R_p=$4,200.00
g_a = $1,500.00

$$VA=\left[(Rp_1+\frac{ga}{i/m})\left[\frac{(1+i/m)^n-1}{i/m}\right]-\frac{n*ga}{i/m}\right](1+i/m)^{-n}$$

$$VA=\left[Mga\right](1+i/m)^{-n}$$

$$VA=\left[(4{,}200+\frac{1500}{.35/12})\left[\frac{(1+.35/12)^{30}-1}{.35/12}\right]-\frac{30*1500}{.35/12}\right](1+.35/12)^{-30}$$

$$VA=\left[(4{,}200+51{,}428.5726)\left[\frac{1.369034242}{.029166666}\right]-\frac{45000}{.029166666}\right](1.029166666)^{-30}$$

$$VA=\left[(55{,}628.5726)\left[46.93831794\right]-1{,}542{,}857.178\right](1.029166666)^{-30}$$

$$VA=\left[2{,}611{,}111.627-1{,}542{,}857.178\right](.422112936)$$

$$VA=\left[1{,}068{,}254.449\right](.422112936)$$

$$VA=\$450{,}924.02222$$

PROBLEMA 3.-

VALOR FUTURO

Datos:
R_{P1}: $35,000.00
G_a: $600.00
n: 10
i/m: 20% capitalizable: (.20/12)= .016666

$$Mga=(Rp_1+\frac{ga}{i/m})\left[\frac{(1+i/m)^n-1}{i/m}\right]-\frac{n*ga}{i/m}$$

$$Mga = (\$35{,}000.00 + \frac{\$600.00}{.20/12})\left[\frac{(1+(.20/12))^{10}-1}{.20/12}\right] - \frac{10*\$600.00}{.20/12}$$

$$Mga = (\$35{,}000.00 + \$36{,}001.44)\left[\frac{(1+0.0166666)^{10}-1}{0.0166666}\right] - \frac{10*\$600.00}{0.0166666}$$

$$Mga = (\$71{,}001.44)\left[\frac{(1.17973798)-1}{0.0166666}\right] - \frac{\$6{,}000.00}{0.0166666}$$

$$Mga = (\$71{,}001.44)\left[10.78432199\right] - \$360{,}001.44$$

$$Mga = \$765{,}702.39 - \$360{,}001.44$$

$$Mga = \$405{,}700.95$$

VALOR ACTUAL

Datos:

R_P: \$35,000.00
G_a: \$600.00
n: 10
i/m: 20% capitalizable: .20/12: .016666

$$VA = \left[Rp1 + \frac{Ga}{\frac{i}{m}}\right]\left[\frac{\left(1+\frac{i}{m}\right)^{n} - 1}{\frac{i}{m}}\right]\left[-\frac{n*Ga}{\frac{i}{m}}\right]\left(1+\frac{i}{m}\right)^{-n}$$

$$VAga = \left[\$35{,}000.00 + \frac{\$600.00}{.20/12}\left[\frac{(1+(.20/12))^{10}-1}{.20/12}\right] - \frac{10*\$600.00}{.20/12}\right]*(1+{}^{.20}\!/_{12})^{-10}$$

$$VAga = \left[\$35{,}000.00 + \$36{,}001.44\left[\frac{(1+0.0166666)^{10}-1}{0.0166666}\right] - \frac{\$6{,}000.00}{0.0166666}\right]*(1.166666)^{-10}$$

$$VAga = \left[\$71{,}001.44\left[\frac{(1.17973798)-1}{0.0166666}\right] - \frac{\$6{,}000.00}{0.0166666}\right]*(0.21405844)$$

$$VAga = \left[\$71{,}001.44\left[10.78432199\right] - \$360{,}001.44\right]*(0.21405844)$$

$$VAga = \left[\$765{,}702.39 - \$360{,}001.44\right]*(0.21405844)$$

$$Mga = \$405{,}700.95*0.21405844$$

$$Mga = \$86{,}843.71$$

GRADIENTES GEOMÉTRICOS

PROBLEMA 1.-

Cuotas Anticipadas (Prepagables) con Gg:

Datos:
n = 9
Mg_g=?
i= 10% anual = $\frac{10}{2}$% semestral= 5% semestral = 0.00833333 mensual
R_p=$24,870.00
G_g = 3.5% semestral

$$Si(1+i/m) \neq Gg \qquad Mg_g = Rp_1(1+i/m)\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]$$

$$Mg_g = \$24,870(1+0.05/6)\left[\frac{(1+0.05/6)^9-(1+0.035)^9}{(0.05/6)-0.035}\right]$$

$$Mg_g = \$24,870.00(1.008333333)\left[\frac{(1.00833333)^9-(1.035)^9}{(0.008333)-.035}\right]$$

$$Mg_g = \$25,077.24999\left[\frac{1.077549192-1.362897353}{-.026667}\right]$$

$$Mg_g = \$25,077.24999\left[\frac{-0.285348161}{-.026667}\right]$$

$$Mg_g = \$25,077.24999[10.70042228]$$
$$Mg_g = \$268,337.1646$$

TABLA DE DESPEJES

Valor Actual del Rp	Valor de "n" plazo
Fórmula original: $Si(1+i/m)\neq Gg \qquad Mg_g = Rp_1(1+i/m)\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]$ **Despeje:** $\frac{Mg_g}{(1+i/m)\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]} = Rp_1$ **Datos:** n = 9 Mgg= 268,337.1646 i= 10% anual = $\frac{10}{2}$% semestral= 5% semestral = 0.00833333 mensual Rp=? Gg = 3.5% semestral $\frac{\$268,337.1646}{(1+.05/6)\left[\frac{(1+0.05/6)^9-(1+.035)^9}{(.05/6)-.035}\right]} = Rp_1$ $\frac{\$268,337.1646}{(1.0083333)\left[\frac{(1.077546018)-(1.362897353)}{(.008333)-.035}\right]} = Rp_1$ $\frac{\$268,337.1646}{(1.0083333)\left[\frac{(-0.285351335)}{(-0.026667)}\right]} = Rp_1$ $\frac{\$268,337.1646}{(1.0083333)\left[-10.70054131\right]} = Rp_1$ $\frac{\$268,337.1646}{(10.78971213)} = Rp_1$ $\$24,869.72417 = Rp_1$ $\boldsymbol{Rp_1 = \$24,870.00}$	**Fórmula original:** $(1+Gg)^x-(1+i/m)^x-\left[\frac{Mgg}{Rp_1(1+i/m)}*(i/m-Gg)\right]=0$ **Se tiene que satisfacer la fórmula:** $(1+.035)^x-(1+.05/6)^x-\left[\frac{\$268,337.1646}{\$24,870.00(1+.05/6)}*(.05/6-.035)\right]=0$ **A prueba y error utilizamos para "x"= 8, 10 respectivamente y obtenemos:** $(1+.035)^8-(1+.05/6)^8-\left[\frac{\$268,337.1646}{\$24,870.00(1+.05/6)}*(.05/6-.035)\right]=0$ $(1.316809037)-(1.068643858)-[10.70042228*(-.026666666)]=0$ $(1.316809037)-(1.068643858)-0.285344594=-.037179415$ $(1+.035)^{10}-(1+.05/6)^{10}-\left[\frac{\$268,337.1646}{\$24,870.00(1+.05/6)}*(.05/6-.035)\right]=0$ $(1.410598761)-(1.086528801)-[10.70042228*(-.026666666)]=0$ $(1.410598761)-(1.086528801)-0.285344594=.038725366$ "n" está entre 8 y 10

Cuotas Pospagables (vencidas) con Gg:

Datos:
n = 9
Mg_g=?
i= 10% anual = $\frac{10}{2}$% semestral= 5% semestral = 0.00833333 mensual
R_p=$24,870.00
G_g = 3.5% semestral

De la Fórmula:

$$Si(1+i/m) \neq Gg \qquad Mg_g = Rp_1(1+i/m)\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]$$

Se Modifica:

$$Si(1+i/m) \neq Gg \qquad Mg_g = Rp_1\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]$$

$$Mg_g = \$24,870.00\left[\frac{(1+0.05/6)^9-(1+0.035)^9}{(0.05/6)-0.035}\right]$$

$$Mg_g = \$24,870.00\left[\frac{(1.0083333)^9-(1.035)^9}{(0.0083333)-0.035}\right]$$

$$Mg_g = \$24,870.00\left[\frac{(1.07754903-1.362897353}{-.0266667}\right]$$

$$Mg_g = \$24,870.00\left[\frac{-0.28534323}{-.0266667}\right]$$

$$Mg_g = \$24,870.00\left[10.70054874\right]$$

$$Mg_g = \$266,122.6471$$

TABLA DE DESPEJES

Valor Actual Rp1	Valor de "n" plazo
Fórmula original: $Si(1+i/m) \neq Gg$ $Mg_g = Rp_1\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]$	**Fórmula Original :** $(1+Gg)^x-(1+i/m)^x-\left[\frac{Mgg}{Rp_1}*(i/m-Gg)\right]=0$

Despeje:

$$\frac{Mg_g}{\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]}=Rp_1$$

Datos:

n = 9

Mg_g=$266,122.6471

i= 10% anual= $\frac{10}{2}$ % semestral= 5% semestral = 0.00833333 mensual

R_p=?

G_g = 3.5%

$$\frac{266122.6471}{\left[\frac{(1+.05/6)^9-(1+.035)^9}{(.05/6)-.035}\right]}=Rp_1$$

$$\frac{266122.6471}{\left[\frac{(1.077549224)-(1.362897353)}{(.026666)}\right]}=Rp_1$$

$$\frac{266122.6471}{\left[\frac{(.285348129)}{(.026666)}\right]}=Rp_1$$

$$\frac{266122.6471}{\left[10.70082236\right]}=Rp_1$$

$$24869.36407=Rp_1$$

Se tiene que satisfacer la fórmula:

$$(1+.035)^x-(1+.05/6)^x-\left[\frac{\$266,122.6471}{\$24,870.00}*(.05/6-.035)\right]=0$$

A prueba y error utilizamos para "x"= 8, 10 respectivamente y obtenemos:

$$(1+.035)^8-(1+.05/6)^8-\left[\frac{\$266,122.6471}{\$24,870.00}*(.05/6-.035)\right]=0$$

$$(1.316809037)-(1.068643858)-[10.70054874*(-.026666666)]=0$$

$$(1.316809037)-(1.068643858)-0.285347966=-.037182787$$

$$(1+.035)^{10}-(1+.05/6)^{10}-\left[\frac{\$266,122.6471}{\$24,870.00}*(.05/6-.035)\right]=0$$

$$(1.410508761)-(1.086528801)-[10.70054874*(-.026666666)]=0$$

$$(1.410508761)-(1.068643858)-0.285347966=.056516937$$

"n" está entre 8 y 10

PROBLEMA 2.-

Cuotas Anticipadas (Prepagables) con Gg:

Datos:

n = 18 mensualidades
Mg_g=?
i= 27% nominal con capitalización mensual
R_p=$2,700.00
G_g = 4.3%

$$Si(1+i/m) \neq Gg \qquad Mg_g = Rp_1(1+i/m)\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]$$

$$Mg_g = \$2{,}700.00(1+.27/12)\left[\frac{(1+.27/12)^{18}-(1+.043)^{18}}{(.27/12)-.043}\right]$$

$$Mg_g = \$2{,}700.00(1.0225)\left[\frac{(1.0225)^{18}-(1.043)^{18}}{(.0225)-.043}\right]$$

$$Mg_g = \$2{,}760.75\left[\frac{1.492587156-2.133622348}{-.0205}\right]$$

$$Mg_g = \$2{,}760.75\left[\frac{-.641035192}{-.0205}\right]$$

$$Mg_g = \$2{,}760.75\left[31.27000937\right]$$

$$Mg_g = \$86{,}328.67836$$

TABLA DE DESPEJES

Valor Actual del Rp	Valor de "n" plazo
Fórmula original: $Si(1+i/m) \neq Gg \qquad Mg_g = Rp_1(1+i/m)\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]$	**Fórmula:** $(1+Gg)^x-(1+i/m)^x-\left[\frac{Mga}{Rp_1(1+i/m)}*(i/m-Gg)\right]=0$
Despeje: $\frac{Mg_g}{(1+i/m)\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]}=Rp_1$	**Se tiene que satisfacer la fórmula:** $(1+.043)^x-(1+.27/12)^x-\left[\frac{\$86,328.67836}{\$2,700.00(1+.27/12)}*(.27/12-.043)\right]=0$ **A prueba y error utilizamos para "x"= 17, 19 respectivamente y obtenemos:**

Datos:

n = 18 mensualidades
Mg_g=$86,328.67836
i= 27% nominal con capitalización mensual
R_p=?
G_g = 4.3%

$$\frac{\$86,328.67836}{(1+.27/12)\left[\frac{(1+.27/12)^{18}-(1+.043)^{18}}{(.27/12)-.043}\right]}=Rp_1$$

$$\frac{\$86,328.67836}{(1.0225)\left[\frac{(1.0225)^{18}-(1.043)^{18}}{(.0225)-.043}\right]}=Rp_1$$

$$\frac{\$86,328.67836}{(1.0225)\left[\frac{1.492587156-2.133622348}{-.0205}\right]}=Rp_1$$

$$\frac{\$86,328.67836}{(1.0225)\left[\frac{-.641035192}{-.0205}\right]}=Rp_1$$

$$\frac{\$86,328.67836}{(1.0225)[31.27000937]}=Rp_1$$

$$\frac{\$86,328.67836}{31.97358458}=Rp_1$$

$$\$2,700.00=Rp_1$$

$$(1+.043)^{17}-(1+.27/12)^{17}-\left[\frac{\$86,328.67836}{\$2,700.00(1+.27/12)}*(.27/12-.043)\right]=0$$

$$(2.045659011)-(1.45974294)-[31.27000937*(-.0205)]=0$$

$$(2.045659011)-(1.45974294)-[-.641035192]=-.055119121$$

$$(1+.043)^{19}-(1+.27/12)^{19}-\left[\frac{\$86,328.67836}{\$2,700.00(1+.27/12)}*(.27/12-.043)\right]=0$$

$$(2.225368109)-(1.526170367)-\left[\frac{\$86,328.67836}{2,760.75}*(-.0205)\right]=0$$

$$(2.225368109)-(1.526170367)-[31.27000764*(-.0205)]=0$$

$$(2.225368109)-(1.526170367)-[-.641035156]=.058162586$$

"n" está entre 17 y 19

Cuotas Pospagables (vencidas) con Gg:

Datos:
n = 18 mensualidades
Mg_g=?
i= 27% nominal con capitalización mensual
R^p=$2,700.00
G^g = 4.3%

De la Fórmula:

$$Si(1+i/m) \neq Gg \qquad Mg_g = Rp_1(1+i/m)\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]$$

Se Modifica:

$$Si(1+i/m) \neq Gg \qquad Mg_g = Rp_1\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]$$

$$Mg_g = \$2{,}700.00\left[\frac{(1+.27/12)^{18}-(1+.043)^{18}}{(.27/12)-.043}\right]$$

$$Mg_g = \$2{,}700.00\left[\frac{(1.0225)^{18}-(1.043)^{18}}{(.0225)-.043}\right]$$

$$Mg_g = \$2{,}700.00\left[\frac{(1.492587156-2.133622348}{-.0205}\right]$$

$$Mg_g = \$2{,}700.00\left[\frac{-.641035192}{-.0205}\right]$$

$$Mg_g = \$2{,}700.00\left[31.27000937\right]$$

$$Mg_g = \$84{,}429.02529$$

TABLA DE DESPEJES

Valor Actual Rp1	Valor de "n" plazo
Fórmula original: $Si(1+i/m) \neq Gg$ $Mg_g = Rp_1\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]$ **Despeje:**	**Fórmula Original:** $(1+Gg)^x-(1+i/m)^x-\left[\frac{Mga}{Rp_1}*(i/m-Gg)\right]=0$ **Se tiene que satisfacer la fórmula:**

$$\frac{Mg_g}{\left[\frac{(1+i/m)^n-(1+Gg)^n}{(i/m)-Gg}\right]}=Rp_1$$

Datos:

n = 18 mensualidades
Mg_g= 84,429.02529
i= 27% cap. mensual
R_p=?
G_g = 4.3%

$$\frac{\$84,429.02529}{\left[\frac{(1+.27/12)^{18}-(1+.043)^{18}}{(.27/12)-.043}\right]}=Rp_1$$

$$\frac{\$84,429.02529}{\left[\frac{(1.0225)^{18}-(1.043)^{18}}{(.0225)-.043}\right]}=Rp_1$$

$$\frac{\$84,429.02529}{\left[\frac{1.492587156-2.133622348}{-.0205}\right]}=Rp_1$$

$$\frac{\$84,429.02529}{\left[\frac{-.641035192}{-.0205}\right]}=Rp_1$$

$$\frac{\$84,429.02529}{\left[31.27000937\right]}=Rp_1$$

$$\$2,700.00=Rp_1$$

$$(1+.043)^x-(1+.27/12)^x-\left[\frac{\$84,429.02529}{\$2,700.00}*(.27/12-.043)\right]=0$$

A prueba y error utilizamos para "x"= 17, 19 respectivamente y obtenemos:

$$(1+.043)^{17}-(1+.27/12)^{17}-\left[\frac{\$84,429.02529}{\$2,700.00}*(.27/12-.043)\right]=0$$

$$(2.045659011)-(1.45974294)-\left[31.27000948*(-.0205)\right]=0$$
$$(2.045659011)-(1.45974294)-\left[-.641035194\right]=-.055119123$$

$$(1+.043)^{19}-(1+.27/12)^{19}-\left[\frac{\$84,429.02529}{\$2,700.00}*(.27/12-.043)\right]=0$$

$$(2.225368109)-(1.526170367)-\left[\frac{\$84,429.02529}{2,700.00}*(-.0205)\right]=0$$

$$(2.225368109)-(1.526170367)-\left[31.27000948*(-.0205)\right]=0$$
$$(2.225368109)-(1.526170367)-\left[-.641035194\right]=.062629245$$

"n" está entre 17 y 19

GRADIENTES ARITMETICO-GEOMETRICO

PROBLEMA 1.-

$$MGag = [\left(1+\frac{i}{m}\right)^{n} * \left[A1\frac{\left(1+\frac{i}{m}\right)^{n}-1}{\frac{i}{m}}\right]] + [Gg * \left[\frac{\left(1+\frac{i}{m}\right)^{n}- (n*i)-1}{\left(\frac{i}{m}\right)^{2}}\right]]$$

Datos:
A_1: 1.5
G_g: .17
n: 8
i: 15% Capitalización mensual, por lo que sería .15/12= 0.0125

$$MGag = [(1+.0125)^{8} * \left[1.5\frac{(1+.0125)^{8}-1}{.0125}\right]] + [.17 * \left[\frac{(1+.0125)^{8}- \left(\frac{8}{12}*.15\right)-1}{(.0125)^{2}}\right]]$$

$$MGag = [1.104486101 * \left[1.5\frac{.104486101}{.0125}\right]] + [.17 * \left[\frac{1.104486101- (.1)-1}{.00015625}\right]]$$

$$MGag = [1.104486101 * \lceil 1.5(8.35888808)\rceil] + [.17 * \left[\frac{.004486101}{.00015625}\right]]$$

$$MGag = [1.104486101 * \lceil 12.53833212\rceil] + [.17 * \lceil 28.7110464\rceil]$$

$$MGag = [13.84841356 + 4.880877888]$$

$$MGag = 18.72929145$$

PROBLEMA 2.-

Datos:
A_1:$5'500,000.00 =5.5
G_g: $850,000.00 =.85
n: 40
i: 19.65% nominal con capitalización mensual, por lo que sería .1965/12= 0.016375

$$MGag = [\left(1+\frac{i}{m}\right)^{n} * \left[A1\frac{\left(1+\frac{i}{m}\right)^{n}-1}{\frac{i}{m}}\right]] + [Gg * \left[\frac{\left(1+\frac{i}{m}\right)^{n}- (n*i)-1}{\left(\frac{i}{m}\right)^{2}}\right]]$$

$$MGag = [(1.016375)^{40} * \left\lceil 5.5\frac{(1.016375)^{40} - 1}{.016375}\right\rceil] + [.85 * \left\lceil\frac{(1.016375)^{40} - (40 * .1965/12) - 1}{(.016375)^2}\right\rceil]$$

$$MGag = [(1.016375)^{40} * \left\lceil 5.5\frac{.91495672}{.016375}\right\rceil] + [.85 * \left\lceil\frac{1.91495672 - (40 * .016375) - 1}{.00026814062}\right\rceil]$$

$$MGag = [(1.016375)^{40} * \lceil 5.5\ (55.87521954)\rceil] + [.85 * \left\lceil\frac{1.91495672 - (.655) - 1}{.00026814062}\right\rceil]$$

$$MGag = [(1.016375)^{40} * \lceil 5.5\ (55.87521954)\rceil] + [.85 * \left\lceil\frac{.25995672}{.00026814062}\right\rceil]$$

$$MGag = [(1.016375)^{40} * \lceil 5.5\ (55.87521954)\rceil] + [.85 * \lceil 969.4813157\rceil]$$

$$MGag = [1.91495672 * \lceil 307.3137075\rceil] + [\ 824.0591184]$$

$$MGag = \$588.4924493 + \$824.0591184$$

$$MGag = \$1{,}412.551568$$

$$MGag = \$1{,}412{,}551{,}568.00$$