

UFRJ
Matemática Financeira
Professor Alexandre B. Cunha
Lista 1
Gabarito Sintético

1.

$$C_n - C_{n-1} = i_n C_0$$

Aplique o raciocínio utilizado nas páginas 2 e 3 das notas de aula para concluir que

$$C_n = C_0 \left(1 + \sum_{t=1}^n i_t \right).$$

2.

$$C_n - C_{n-1} = i_n C_{n-1}$$

Utilize a igualdade acima e o Princípio da Indução para concluir que

$$C_n = C_0 \prod_{t=1}^n (1 + i_t).$$

3. 100; 50; 20

Raciocínio

$$C_n = 2C_0 \implies C_0(1 + ni) = 2C_0 \implies 1 + in = 2 \implies in = 1 \implies n = 1/i$$

4. 70; 36; 15

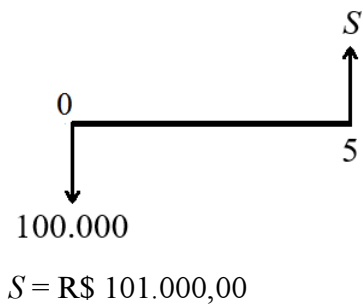
Raciocínio

$$C_n = 2C_0 \implies C_0(1 + i)^n = 2C_0 \implies (1 + i)^n = 2 \implies n = \frac{\ln 2}{\ln(1 + i)}$$

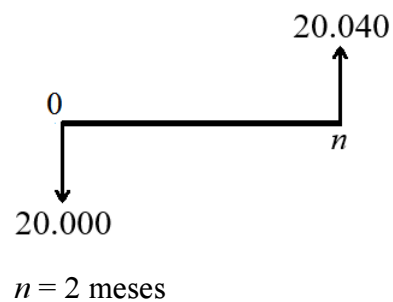
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Lista 2

Gabarito Sintético

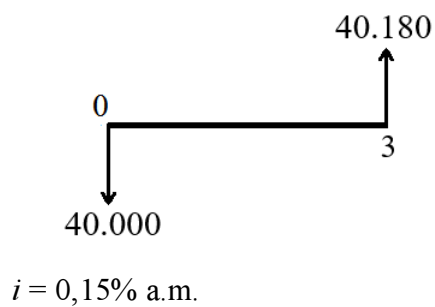
1.



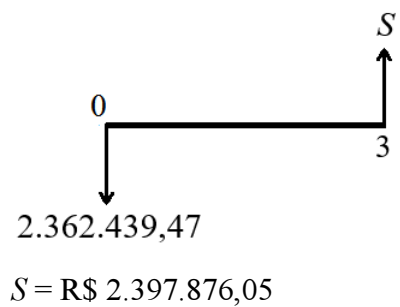
2.



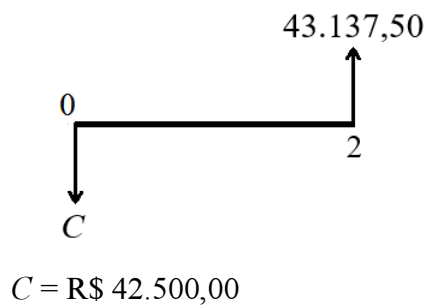
3.



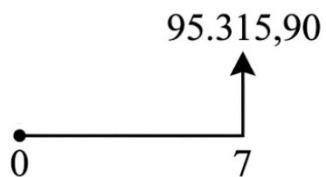
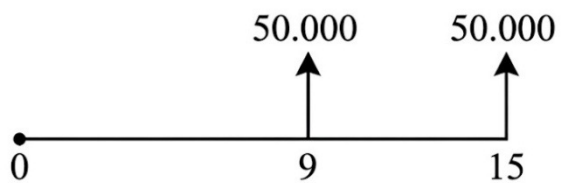
4.



5.



6.



Obs.: V_t corresponde ao valor atual na data t do fluxo de caixa original, ao passo que W_t corresponde ao valor atual na data t do fluxo de caixa proposto.

$$T = 0$$

$$V_0 = 89.349,82 > 89.080,28 = W_0 \quad \text{recusar}$$

$$T = 7$$

$$V_7 = 95.315,90 = W_7 \quad \text{indiferença}$$

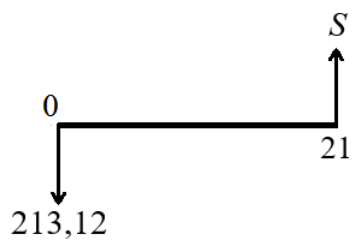
$$T = 9$$

$$V_9 = 97.169,81 < 97.222,22 = W_9 \quad \text{aceitar}$$

$$T = 15$$

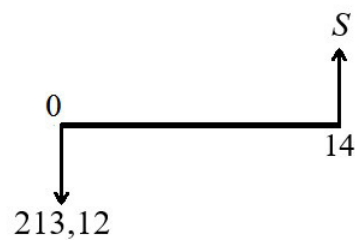
$$V_{15} = 103.000,00 > 102.941,17 = W_{15} \quad \text{recusar}$$

7.



$$S = \text{R\$ } 217,60$$

8.

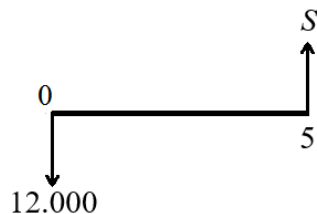


$$S = \text{R\$ } 216,10$$

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Lista 3

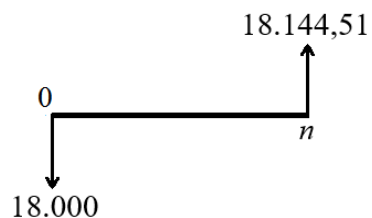
Gabarito Sintético

1.



$$S = \text{R\$ } 11.120,48$$

2.



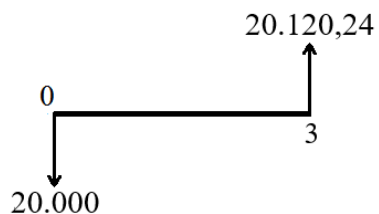
Avalie a expressão

$$n = \frac{\ln\left(\frac{18.144,51}{18.000}\right)}{\ln 1,001}$$

para concluir que $n = 8$.

Comentário: certifique-se que 18.000 aplicados à taxa de 0,1% a.m. efetivamente gera o montante de 18.144,51.

3.



Avalie a expressão $i = (20.120,24/20.000)^{1/3} - 1$ para concluir que $i = 0,2000\%$ a.m.

4. [completa]



Observe que $m = n + f$, onde $n = 2$ e $f = 3/12 = 0,25$. Adicionalmente,

$$C_2 = 12.795,02(1 + 0,03)^2.$$

De acordo com a convenção linear, C_m é dado por

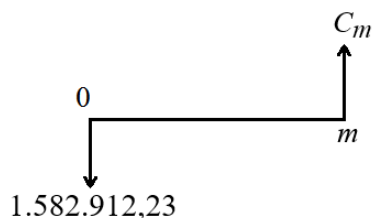
$$C_m = C_2(1 + if) = 12.795,02(1 + 0,03)^2(1 + 0,03 \times 0,25) \Rightarrow C_m = 13.676,04.$$

Por sua vez, de acordo com a convenção exponencial,

$$C_m = C_2(1 + i)^f = 12.795,02(1 + 0,03)^2(1 + 0,03)^{0,25} \Rightarrow C_m = 13.674,92.$$

Desta forma, com a Convenção Linear e com a Convenção Exponencial os montantes serão respectivamente iguais a R\$ 13.676,04 e R\$ 13.674,92.

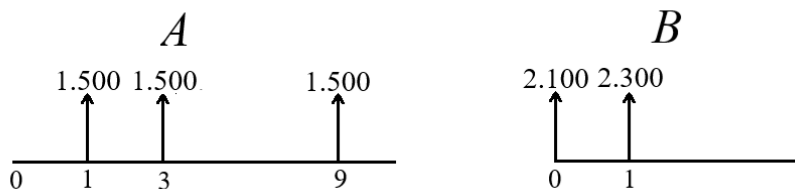
5.



R\$ 1.728.223,57 (linear)

R\$ 1.727.490,36 (exponencial)

6. [completa]



Observe que como a data focal é irrelevante, não perda de generalidade em se restringir a análise a data 0. Denote por V_A e V_B o valor atual na data 0 dos correspondentes fluxos de caixa. Assim sendo,

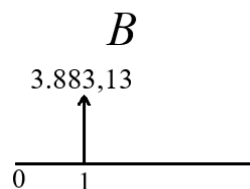
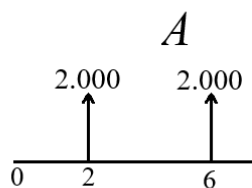
$$V_A = \frac{1.500}{1,006} + \frac{1.500}{1,006^3} + \frac{1.500}{1,006^9} \Rightarrow V_A = 4.385,75.$$

Ademais,

$$V_B = 2.100 + \frac{2.300}{1,006} \Rightarrow V_B = 4.386,28.$$

Como $V_A < V_B$ valor atual, Fulano deve aceitar a proposta.

7.



$V_A = 3.844,68 = V_B$
indiferença

8.

$i = 0,5\%$ a.m.

$V_A = 3.921,19 > 3.863,81 = V_B$

recusar

$i = 2\%$ a.m.

$V_A = 3.698,28 < 3.806,99 = V_B$

aceitar

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Lista 4

Gabarito Sintético

1.

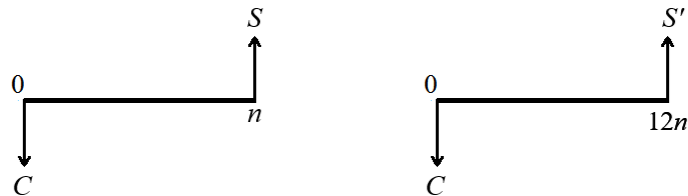
$$\frac{i}{0,3\%} = 12 \Rightarrow i = 3,6\% \text{ a.a.}$$

2. $i = 3\% \text{ a.m.}$

3. $i = 10,84\% \text{ a.a.}$

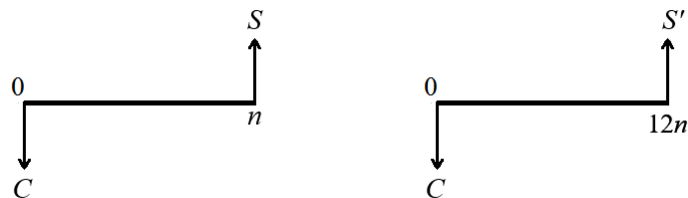
4. $i = 0,0333\% \text{ a.d.}$

5.



$$S = S' \Rightarrow C(1 + 0,09n) = C[1 + i(12n)] \Rightarrow 0,09n = i(12n) \Rightarrow i = 0,75\% \text{ a.m.}$$

6.



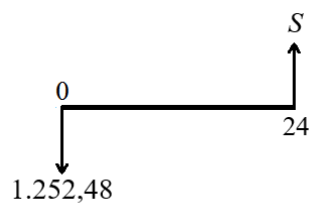
$$S = S' \Rightarrow C(1 + 0,09)^n = C(1 + i)^{12n} \Rightarrow (1 + 0,09)^n = (1 + i)^{12n}$$

$$\Rightarrow 1 + i = (1 + 0,09)^{1/12} \Rightarrow i = 0,7207\% \text{ a.m.}$$

7. $6\% \text{ a.s.}$

8. $6,1520\%$

9.



$$S = 1.252,48 \left(1 + \frac{0,06}{12} \right)^{24} \Rightarrow S = \text{R\$ } 1.411,75$$

10. $S = \text{R\$ } 36.921,88$

11.

$$1 + i_{du} = (1 + i_a)^{1/252}$$

0,024620% 0,038370% 0,031096%

12.

$$1 + i_a = (1 + i_{du})^{252}$$

9,15% 7,40% 6,90%

13.

$$1 + i = (1 + i_a)^{n/N}$$

1,4297% 1,4100% 1,4728%

14. Há 90 dias corridos e 62 dias úteis.

3,4995% 3,4507% 3,4430%