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Lista de Exercícios - Matemática 1 - Semana 8

1) Escreva em forma de tabela as matrizes dadas:

1.1 - $A=(a_{ij})_{3\times3}$, com $a_{ij}=1/2\,(-i)^2-2/3\,(-(j)^2)$

$$A=\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}_{3\times3} \quad ; \quad A=\begin{bmatrix} +7/6 & +19/6 & +13/2 \\ +8/3 & +14/3 & +8 \\ +31/6 & +43/6 & +21/2 \end{bmatrix}_{3\times3}$$

$a_{11}=1/2\,(-1)^2-2/3(-(1)^2)=$
$1/2.1+2/3.1=1/2+2/3=$
$3/6+4/6=+7/6$

$a_{12}=1/2\,(-1)^2-2/3\,(-(2)^2)=$
$1/2.1+2/3.4=1/2+8/3=$
$3/6+16/6=+19/6$

$a_{13}=1/2\,(-1)^2-2/3(-(3)^2)=$
$1/2.1+2/3.9=1/2+18/3=$
~~3/6~~ $1/2+6/1=1/2+12/2=$
$+13/2$

$a_{21}=1/2(-2)^2-2/3(-(1)^2)=$
$1/2.4+2/3.1=4/2+2/3=$
$2/1+2/3=6/3+2/3=$
$+8/3$

$a_{22}=1/2(-2)^2-2/3(-(2)^2)=$
$1/2.4+2/3.4=4/2+8/3=$
$2/1+8/3=6/3+8/3=$
$+14/3$

$a_{23}=1/2(-2)^2-2/3(-(3)^2)=$
$1/2.4-2/3.9=4/2+18/3=$
$2/1+6/1=8/1=+8$

$a_{31}=1/2(-3)^2-2/3(-(1)^2)=$
$1/2.9+2/3.1=9/2+2/3=$
$27/6+4/6=31/6\Rightarrow+31/6$

$a_{32}=1/2(-3)^2-2/3(-(2)^2)=$
$1/2.9+2/3.4=9/2+8/3=$
$27/6+16/6=+43/6$

$a_{33}=1/2(-3)^2-2/3(-(3)^2)=$
$1/2.9+2/3.9=9/2+18/3=$
$9/2+6/1=9/2+12/2=$
$+21/2$

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1.2 - $A = (a_{ij})_{4\times4}$, com $a_{ij} = -i^2 - j^2$

$$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} \\ a_{21} & a_{22} & a_{23} & a_{24} \\ a_{31} & a_{32} & a_{33} & a_{34} \\ a_{41} & a_{42} & a_{43} & a_{44} \end{bmatrix}_{4\times4} ; \quad A = \begin{bmatrix} -2 & -5 & -10 & -17 \\ -5 & -8 & -13 & -20 \\ -10 & -13 & -18 & -25 \\ -17 & -20 & -25 & -32 \end{bmatrix}_{4\times4}$$

$a_{11} = -i^2 - j^2 = -1^2 - 1^2 =$
~~$1+1=2$~~, $-1-1=-2$ //

$a_{12} = -i^2 - j^2 = -1^2 - 2^2 =$
$-1-4=-5$ //

$a_{13} = -i^2 - j^2 = -1^2 - 3^2 =$
$-1-9=-10$ //

$a_{14} = -i^2 - j^2 = -1^2 - 4^2 =$
$-1-16=-17$ //

$a_{21} = -i^2 - j^2 = -2^2 - 1^2 =$
$-4-1=-5$ //

$a_{22} = -i^2 - j^2 = -2^2 - 2^2 =$
$-4-4=-8$ //

$a_{23} = -i^2 - j^2 = -2^2 - 3^2 =$
$-4-9=-13$ //

$a_{24} = -i^2 - j^2 = -2^2 - 4^2 =$
$-4-16=-20$ //

$a_{31} = -i^2 - j^2 = -3^2 - 1^2 =$
$-9-1=-10$ //

$a_{32} = -i^2 - j^2 = -3^2 - 2^2 =$
$-9-4=$ ~~-13~~ -13 //

$a_{33} = -i^2 - j^2 = -3^2 - 3^2 =$
$-9-9=-18$ //

$a_{34} = -i^2 - j^2 = -3^2 - 4^2 =$
$-9-16=-25$ //

$a_{41} = -i^2 - j^2 = -4^2 - 1^2 =$
$-16-1=-17$ //

$a_{42} = -i^2 - j^2 = -4^2 - 2^2 =$
$-16-4=-20$ //

$a_{43} = -i^2 - j^2 = -4^2 - 3^2 =$
$-16-9=-25$ //

$a_{44} = -i^2 - j^2 = -4^2 - 4^2 =$
$-16-16=-32$ //

1.3 - $A = (a_{ij})_{4\times4}$, com $a_{ij} = -3/4\, i + 1/3 + 5/6\, j^2$

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$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} \\ a_{21} & a_{22} & a_{23} & a_{24} \\ a_{31} & a_{32} & a_{33} & a_{34} \\ a_{41} & a_{42} & a_{43} & a_{44} \end{bmatrix}_{4\times4}$; $A = \begin{bmatrix} 5/12 & 35/12 & 85/12 & 155/12 \\ -1/3 & 13/6 & 19/3 & 73/6 \\ -13/12 & 17/12 & 67/12 & 137/12 \\ -11/6 & 2/3 & 29/6 & 32/3 \end{bmatrix}_{4\times4}$

$a_{11} = -3/4 \cdot 1 + 1/3 + 5/6 \cdot 1^2 =$
$-3/4 + 1/3 + 5/6 \cdot 1 =$
$-3/4 + 1/3 + 5/6 =$
$\frac{-9+4+10}{12} = +\frac{5}{12}$,,

$a_{12} = -3/4 \cdot 1 + 1/3 + 5/6 \cdot 2^2 =$
$-3/4 + 1/3 + 5/6 \cdot 4 =$
$-3/4 + 1/3 + 20/6 =$
$\frac{-9+4+40}{12} = +\frac{35}{12}$,,

3, 4, 6	2
3, 2, 3	2
1, 1, 1	3
	12,,

$a_{13} = -3/4 \cdot 1 + 1/3 + 5/6 \cdot 3^2 =$
$-3/4 + 1/3 + 5/6 \cdot 9 =$
$-3/4 + 1/3 + 45/6 =$
$\frac{-9+4+90}{12} = +\frac{85}{12}$,,

$a_{14} = -3/4 \cdot 1 + 1/3 + 5/6 \cdot 4^2 =$
$-3/4 + 1/3 + 5/6 \cdot 16 =$
$-3/4 + 1/3 + 80/6 =$
$-3/4 + 1/3 + 40/3 =$
$\frac{-9+4+160}{12} = +\frac{155}{12}$,,

$a_{21} = -3/4 \cdot 2 + 1/3 + 5/6 \cdot 1^2 =$
$-6/4 + 1/3 + 5/6 \cdot 1 =$
$-3/2 + 1/3 + 5/6 =$
$\frac{-9+2+5}{6} = \frac{-9+7}{6} =$
$\frac{-2}{6} = -\frac{1}{3}$,,

$a_{22} = -3/4 \cdot 2 + 1/3 + 5/6 \cdot 2^2 =$
$-6/4 + 1/3 + 5/6 \cdot 4 =$
$-3/2 + 1/3 + 20/6 =$
$\frac{-9+2+20}{6} = \frac{-9+22}{6} = +\frac{13}{6}$,,

2, 3, 6	2
1, 3, 3	3
1, 1, 1	6,,

$a_{23} = -3/4 \cdot 2 + 1/3 + 5/6 \cdot 3^2 =$
$-6/4 + 1/3 + 5/6 \cdot 9 =$
$-3/2 + 1/3 + 45/6 =$
$\frac{-9+2+45}{6} = \frac{-9+47}{6} = +\frac{38}{6} =$
$+\frac{38 \div 2}{6 \div 2} = +\frac{19}{3}$,,

$a_{24} = -3/4 \cdot 2 + 1/3 + 5/6 \cdot 4^2 =$
$-6/4 + 1/3 + 5/6 \cdot 16 =$
$-3/2 + 1/3 + 80/6 =$
$-3/2 + 1/3 + 40/3 =$
$\frac{-9+2+80}{6} = \frac{-9+82}{6} = +\frac{73}{6}$,,

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$a_{31} = -3/4 \cdot 3 + 5/3 + 5/6 \cdot 1^2 =$
$-9/4 + 5/3 + 5/6 \cdot 1 =$
$-9/4 + 5/3 + 5/6 =$
$\frac{-27+4+10}{12} = \frac{-27+14}{12} =$
$\frac{-13}{12}$

$a_{32} = -3/4 \cdot 3 + 5/3 + 5/6 \cdot 2^2 =$
$-9/4 + 5/3 + 5/6 \cdot 4 =$
$-9/4 + 5/3 + 20/6 =$
$\frac{-27+4+40}{12} = \frac{-27+44}{12} = \frac{+17}{12}$

$a_{33} = -3/4 \cdot 3 + 5/3 + 5/6 \cdot 3^2 =$
$-9/4 + 5/3 + 5/6 \cdot 9 =$
$-9/4 + 5/3 + 45/6 =$
$\frac{-27+4+90}{12} = \frac{-27+94}{12} = \frac{+67}{12}$

$a_{34} = -3/4 \cdot 3 + 5/3 + 5/6 \cdot 4^2 =$
$-9/4 + 5/3 + 5/6 \cdot 16 =$
$-9/4 + 5/3 + 80/6 =$
$\frac{-27+4+160}{12} = \frac{-27+164}{12} = \frac{+137}{12}$

$a_{41} = -3/4 \cdot 4 + 5/3 + 5/6 \cdot 1^2 =$
$-12/4 + 5/3 + 5/6 \cdot 1 =$
$-3/1 + 5/3 + 5/6 =$
$\frac{-18+2+5}{6} = \frac{-18+7}{6} = \frac{-11}{6}$

$a_{42} = -3/4 \cdot 4 + 5/3 + 5/6 \cdot 2^2 =$
$-12/4 + 5/3 + 5/6 \cdot 4 =$
$-3/1 + 5/3 + 20/6 =$
$\frac{-18+2+20}{6} = \frac{-18+22}{6} = \frac{+4^{:2}}{6:2} = \frac{+2}{3}$

$a_{43} = -3/4 \cdot 4 + 5/3 + 5/6 \cdot 3^2 =$
$-12/4 + 5/3 + 5/6 \cdot 9 =$
$-3 + 5/3 + 45/6 =$
$\frac{-18+2+45}{6} = \frac{-18+47}{6} = \frac{+29}{6}$

$a_{44} = -3/4 \cdot 4 + 5/3 + 5/6 \cdot 4^2 =$
$-12/4 + 5/3 + 5/6 \cdot 16 =$
$-3/1 + 5/3 + 80/6 =$
$\frac{-18+2+80}{6} = \frac{-18+82}{6} = \frac{+64^{:2}}{6:2} = \frac{+32}{3}$

1.4- $A = (a_{ij})_{3\times3}$, com $a_{ij} = -7/2\, i + 5/3\, j^2$

$$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}_{3\times3} ; \quad A = \begin{bmatrix} -11/6 & 19/6 & 23/2 \\ -16/3 & -1/3 & 8 \\ -53/6 & -23/6 & 9/2 \end{bmatrix}_{3\times3}$$

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$a_{11} = -7/2 \cdot 1 + 5/3 \cdot 1^2 =$
$-7/2 \cdot 3 + 5/3 \cdot 3 =$
$-7/2 + 5/3 =$
$\frac{-21+10}{6} = \frac{-21+10}{6} = \frac{-11}{6}$

$a_{12} = -7/2 \cdot 3 + 5/3 \cdot 2^2 =$
$-7/2 + 5/3 \cdot 4 =$
$-7/2 + 20/3 =$
$\frac{-21+40}{6} = +\frac{19}{6}$

2,3	2
1,3	3
1,1	6

$a_{13} = -7/2 \cdot 3 + 5/3 \cdot 3^2 =$
$-7/2 + 5/3 \cdot 9 =$
$-7/2 + 45/3 =$
$\frac{-21+90}{6} = \frac{69}{6:3} = +\frac{23}{2}$

$a_{14} = -7/2 \cdot 3 + 5/3 \cdot 4^2 =$
$-7/2 + 5/3 \cdot 16 =$
$-7/2 + 80/3 =$
$\frac{-21+160}{6} = +\frac{139}{6}$

$a_{21} = -7/2 \cdot 2 + 5/3 \cdot 1^2 =$
$-14/2 + 5/3 \cdot 1 =$
$-7/1 + 5/3 =$
$\frac{-21+5}{3} = -\frac{16}{3}$

$a_{22} = -7/2 \cdot 2 + 5/3 \cdot 2^2 =$
$-7/1 + 5/3 \cdot 4 =$
$-7/1 + 20/3 =$
$\frac{-21+20}{3} = -\frac{1}{3}$

$a_{23} = -7/2 \cdot 2 + 5/3 \cdot 3^2 =$
$-7/1 + 5/3 \cdot 9 =$
$-7/1 + 45/3 =$
$\frac{-21+45}{3} = +\frac{24}{3} = +8$

$a_{24} = -7/2 \cdot 2 + 5/3 \cdot 4^2 =$
$-7/1 + 5/3 \cdot 16 =$
$-7/1 + 80/3 =$
$\frac{-21+80}{3} = +\frac{59}{3}$

$a_{31} = -7/2 \cdot 3 + 5/3 \cdot 1^2 =$
$-21/2 + 5/3 \cdot 3 =$
$-21/2 + 5/3 =$
$\frac{-63+10}{6} = -\frac{53}{6}$

$a_{32} = -7/2 \cdot 3 + 5/3 \cdot 2^2 =$
$-21/2 + 5/3 \cdot 4 = -21/2 + 20/3 =$
$\frac{-63+40}{6} = -\frac{23}{6}$

$a_{33} = -7/2 \cdot 3 + 5/3 \cdot 3^2 =$
$-21/2 + 5/3 \cdot 9 = -21/2 + 45/3 =$
$\frac{-63+90}{6} = +\frac{27}{6:3} = +\frac{9}{2}$

$a_{34} = -7/2 \cdot 3 + 5/3 \cdot 4^2 =$
$-21/2 + 5/3 \cdot 16 = -21/2 + 80/3 =$
$\frac{-63+160}{6} = +\frac{97}{6}$

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2) Construir a matriz $A=(a_{ij})_{3\times 2}$, para $a_{ij}=f(i)+f(j)$, onde $f(x)=x+1$.

$$A=\begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \\ a_{31} & a_{32} \end{bmatrix}_{3\times 2} ; A=\begin{bmatrix} 4 & 5 \\ 5 & 6 \\ 6 & 7 \end{bmatrix}_{3\times 2}$$

p/ $x=1 \rightarrow f(1)=1+1=2$
p/ $x=2 \rightarrow f(2)=2+1=3$
p/ $x=3 \rightarrow f(3)=3+1=4$

$a_{11}=f(1)+f(1)=2+2=4$
$a_{12}=f(1)+f(2)=2+3=5$
$a_{21}=f(2)+f(1)=3+2=5$
$a_{22}=f(2)+f(2)=3+3=6$
$a_{31}=f(3)+f(1)=4+2=6$
$a_{32}=f(3)+f(2)=4+3=7$

3) O símbolo delta de Kronecker é definido por:
$\delta_{ij}=\begin{cases}0, \text{ se } i\neq j\\ 1, \text{ se } i=j\end{cases}$, construa a matriz $A=(a_{ij})_{3\times 4}$,
para $a_{ij}=3i+j^2\delta_{ij}$

$$A=\begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} \\ a_{21} & a_{22} & a_{23} & a_{24} \\ a_{31} & a_{32} & a_{33} & a_{34} \end{bmatrix}_{3\times 4} ; A=\begin{bmatrix} 4 & 3 & 3 & 3 \\ 6 & 10 & 6 & 6 \\ 9 & 9 & 18 & 9 \end{bmatrix}_{3\times 4}$$

$a_{11}=3i+j^2\cdot 1=3\cdot 1+1^2\cdot 1=3+1\cdot 1=3+1=4$
$a_{12}=3i+j^2\cdot 0=3\cdot 1+0=3$
$a_{13}=3i+j^2\cdot 0=3\cdot 1+0=3$
$a_{14}=3i+j^2\cdot 0=3\cdot 1+0=3$

$a_{21}=3i+j^2\cdot 0=3\cdot 2+0=6$
$a_{22}=3i+j^2\cdot 1=3\cdot 2+2^2\cdot 1=6+4=10$
$a_{23}=3i+j^2\cdot 0=3\cdot 2+0=6$
$a_{24}=3i+j^2\cdot 0=3\cdot 2+0=6$

$a_{31}=3i+j^2\cdot 0=3\cdot 3+0=9$
$a_{32}=3i+j^2\cdot 0=3\cdot 3+0=9$
$a_{33}=3i+j^2\cdot 1=3\cdot 3+3^2\cdot 1=9+9=18$
$a_{34}=3i+j^2\cdot 0=3\cdot 3+0=9$

50 × 50 = 2500 × 50 = 125000

70 × 70 = 4900 × 70 = 343000

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4) Seja $A=(a_{ij})_{100\times 100}$, onde $a_{ij}=i^3+2j+3$. Determinar a_{35}, a_{502}, a_{1010}, a_{39}, a_{7060}

$a_{35} \Rightarrow L=3,\ C=5;$
$a_{35}=i^3+2.j+3=3^3+2.5+3=27+10+3 \Rightarrow a_{35}=40$

$a_{502} \Rightarrow L=50,\ C=2;$
$a_{502}=i^3+2.j+3=50^3+2.2+3=125000+7 \Rightarrow a_{502}=125007$

$a_{1010} \Rightarrow L=10,\ C=10;$
$a_{1010}=i^3+2.j+3=10^3+2.10+3=1000+23 \Rightarrow a_{1010}=1023$

$a_{39} \Rightarrow L=3,\ C=9;$
$a_{39}=i^3+2.j+3=3^3+2.9+3=27+21 \Rightarrow a_{39}=48$

$a_{7060} \Rightarrow L=70,\ C=60;$
$a_{7060} \Rightarrow i^3+2.j+3=70^3+2.60+3=343000+123 \Rightarrow a_{7060}=343123$

5) Construir a matriz $A=(a_{ij})_{3\times 3}$, em que $a_{ij}=\begin{cases} i-j, \text{ se } i\neq j \\ i+j, \text{ se } i=j \end{cases}$

$$A=\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}_{3\times 3} ; \quad A=\begin{bmatrix} 2 & -1 & -2 \\ 1 & 4 & -1 \\ 2 & 1 & 6 \end{bmatrix}_{3\times 3}$$

$a_{11}=i+j=1+1=2$ | $a_{21}=i-j=2-1=1$ | $a_{31}=i-j=3-1=2$
$a_{12}=i-j=1-2=-1$ | $a_{22}=i+j=2+2=4$ | $a_{32}=i-j=3-2=1$
$a_{13}=i-j=1-3=-2$ | $a_{23}=i-j=2-3=-1$ | $a_{33}=i+j=3+3=6$

6) Escreva em forma de tabela a matriz $A=(a_{ij})_{3\times 3}$, para $a_{ij}=\begin{cases} 2, \text{ se } i<j \\ 1, \text{ se } i>j \\ 0, \text{ se } i=j \end{cases}$

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$A=\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}_{3\times3}$; $A=\begin{bmatrix} 0 & 2 & 2 \\ 1 & 0 & 2 \\ 1 & 1 & 0 \end{bmatrix}_{3\times3}$

$a_{11} = i = j \Rightarrow a_{11} = 0$
$a_{12} = i < j \Rightarrow a_{12} = 2$
$a_{13} = i < j \Rightarrow a_{13} = 2$
$a_{21} = i > j \Rightarrow a_{21} = 1$
$a_{22} = i = j \Rightarrow a_{22} = 0$
$a_{23} = i < j \Rightarrow a_{23} = 2$
$a_{31} = i > j \Rightarrow a_{31} = 1$
$a_{32} = i > j \Rightarrow a_{32} = 1$
$a_{33} = i = j \Rightarrow a_{33} = 0$

7) Determinar os valores de x, y, z e w para que A = B.

$A=\begin{bmatrix} -5x-4 & 1 & 5 \\ 6 & 4 & y-12 \\ z^2 & 3 & -w+8 \end{bmatrix}_{3\times3}$ e $B=\begin{bmatrix} -19 & 1 & 5 \\ 6 & 4 & -12 \\ 144 & 3 & -1 \end{bmatrix}_{3\times3}$

$a_{11} \Rightarrow -5x-4 = -19$
$-5x = -19+4$
$-5x = -15 \cdot (-1)$
$5x = 15$
$x = \frac{15}{5} \Rightarrow \boxed{x=3}$

$a_{23} \Rightarrow y-12 = -12$
$y = -12+12$
$\boxed{y=0}$

$a_{31} = z^2 = 144$
$z = \pm\sqrt{144}$
$\boxed{z = \pm 12}$, ou $\boxed{z = +12}$

$a_{33} \Rightarrow -w+8 = -1$
$-w = -1-8$
$-w = -9 \cdot (-1)$
$\boxed{w=9}$

$A=\begin{bmatrix} -5.3-4 & 1 & 5 \\ 6 & 4 & 0-12 \\ 12^2 & 3 & -9+8 \end{bmatrix}_{3\times3} = B=\begin{bmatrix} -19 & 1 & 5 \\ 6 & 4 & -12 \\ 144 & 3 & -1 \end{bmatrix}_{3\times3}$

8) Determinar os valores de x, y, t e z para que A = B.

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$$A=\begin{bmatrix} 2x & 3y \\ z+t & 6 \end{bmatrix}_{2\times2} \quad e \quad B=\begin{bmatrix} 4 & -9 \\ 1 & 2z \end{bmatrix}_{2\times2}$$

$a_{11} \Rightarrow 2x=4$
$x=\frac{4}{2}$
$\boxed{x=2}$

$a_{12} \Rightarrow 3y=-9$
$y=\frac{-9}{3}$
$\boxed{y=-3}$

$a_{21} \Rightarrow z+t=1$
$3+t=1$
$t=1-3$
$\boxed{t=-2}$

$b_{22} \Rightarrow 2z=6$
$z=\frac{6}{2} \rightarrow \boxed{z=3}$

$$A=\begin{bmatrix} 2.2 & 3.(-3) \\ 3+(-2) & 6 \end{bmatrix}_{2\times2} = B=\begin{bmatrix} 4 & -9 \\ 1 & 2.3 \end{bmatrix}_{2\times2}$$

9) Determinar os valores de x para que $A=B$.

$$A=\begin{bmatrix} x^2-6x+9 & 0 \\ x^2-3x-4 & 1 \end{bmatrix}_{2\times2} \quad e \quad B=\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}_{2\times2}$$

*Observação: As raízes iguais das duas equações de segundo grau será o valor de x na resposta.

$x^2-6x+9=1 \Rightarrow x^2-6x+9-1 \Rightarrow x^2-6x+8=0$

$a=1$
$b=-6$
$c=8$

$\Delta=b^2-4.a.c$
$\Delta=(-6)^2-4.1.8$
$\Delta=36-32$
$\Delta=4 \quad \Delta>0$

$x_{1,2}=\frac{-b\pm\sqrt{\Delta}}{2.a}$

$x_1=\frac{+6-\sqrt{4}}{2.1}=\frac{+6-2}{2}=\frac{4}{2} \Rightarrow x_1=2$

$x_2=\frac{+6+\sqrt{4}}{2.1}=\frac{+6+2}{2}=\frac{8}{2} \Rightarrow x_2=4$

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$x^2 - 3x - 4 = 0$

$a = 1$, $b = -3$, $c = -4$

$\Delta = b^2 - 4.a.c$

$\Delta = (-3)^2 - 4.1.(-4)$

$\Delta = 9 + 16$

$\Delta = 25 \quad \Delta > 0$

$x_{1,2} = \frac{-b \pm \sqrt{\Delta}}{2.a}$

$x_1 = \frac{+3 - \sqrt{25}}{2.1} = \frac{3-5}{2} \Rightarrow x_1 = \frac{-2}{2} = -1$

$x_2 = \frac{+3 + \sqrt{25}}{2.1} = \frac{3+5}{2} = \frac{8}{2} \Rightarrow x_2 = 4$

* Para que $A = B$, em ambos os casos, o valor de x é igual a 4.

$$A = \begin{bmatrix} 4^2 - 6.4 + 9 & 0 \\ 4^2 - 3.4 - 4 & 1 \end{bmatrix}_{2x2} = B = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}_{2x2}$$

10) Determinar os valores de x, y, a e b para que $A = B$.

$$A = \begin{bmatrix} 2x+3y & 5a-b \\ 3x-y & -2a+3b \end{bmatrix}_{2x2} \quad e \quad B = \begin{bmatrix} 7 & 9 \\ -2 & 11 \end{bmatrix}_{2x2}$$

$$\begin{cases} 2x+3y = 7 & .3 \\ 3x-y = -2 & .(-2) \end{cases}$$

$$\begin{cases} 6x+9y = 21 \\ -6x+2y = 4 \end{cases} +$$

$0 + 11y = 25$

$\boxed{y = \frac{25}{11}}$

$$\begin{cases} 5a-b = 9 & .2 \\ -2a+3b = 11 & .5 \end{cases}$$

$$\begin{cases} 10a-2b = 18 \\ -10a+15b = 55 \end{cases} +$$

$0 + 13b = 73$

$\boxed{b = \frac{73}{13}}$

$$\begin{cases} 2x+3y = 7 & .1 \\ 3x-y = -2 & .3 \end{cases}$$

$$\begin{cases} 2x+3y = 7 \\ 9x-3y = -6 \end{cases} +$$

$11x + 0 = 1$

$\boxed{x = \frac{1}{11}}$

$$\begin{cases} 5a-b = 9 & .3 \\ -2a+3b = 11 & .1 \end{cases}$$

$$\begin{cases} 15a-3b = 27 \\ -2a+3b = 11 \end{cases} +$$

$13a + 0 = 38$

$\boxed{a = \frac{38}{13}}$

Oi professora! Então, essa é uma das páginas do conteúdo que copiei do material da última aula... Aí, como ficou um espaço ao final da folha, decidi finalizar a lista de exercícios nesse espaço, pra não utilizar outra folha kkk.

data fecha 25.04.24

2ª Coluna de A = 2ª coluna de B

eliminar x

$$\begin{cases} x - y = 3 \\ -x + 2y = 2 \end{cases}$$

$$\begin{cases} x - y = 3 \\ -x + 2y = 2 \end{cases} +$$

$$0 + y = 5$$

$$\boxed{y = 5}$$

eliminar y

$$\begin{cases} x - y = 3 \quad \times(+2) \\ -x + 2y = 2 \end{cases}$$

$$\begin{cases} +2x - 2y = 6 \\ -x + 2y = 2 \end{cases} +$$

$$+x + 0 = 8$$

$$\boxed{x = 8}$$

$$A = \begin{bmatrix} 3+9 & 8-5 \\ -3.3+2.9 & -8+2.5 \end{bmatrix} \quad ; \quad B = \begin{bmatrix} 12 & 3 \\ 9 & 2 \end{bmatrix}$$

$$A = \begin{bmatrix} 12 & 3 \\ -9+18 & -8+10 \end{bmatrix} ; \quad B = \begin{bmatrix} 12 & 3 \\ 9 & 2 \end{bmatrix}$$

$$A = \begin{bmatrix} 12 & 3 \\ 9 & 2 \end{bmatrix}_{2\times2} = B = \begin{bmatrix} 12 & 3 \\ 9 & 2 \end{bmatrix}_{2\times2}$$

*Algumas vezes coisas ruins acontecem em nossas vidas para nos colocar na direção das melhores coisas que poderíamos viver.

— " — " —

*Continuação da questão 10:

$$A = \begin{bmatrix} 2.(1/11)+3.(25/11) & 5.(38/13)-1.(73/13) \\ 3.(1/11)-1.(25/11) & -2.(38/13)+3.(73/13) \end{bmatrix}_{2\times2}$$

$$= B = \begin{bmatrix} 7 & 9 \\ -2 & 11 \end{bmatrix}_{2\times2}$$