DOM SEG TER QUA JUE VIE SAB

1 $A = B^{-1}$, $A = \begin{bmatrix} x & 1 \\ 5 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 3 & -1 \\ y & 2 \end{bmatrix}$, $x + y = ?$

$A \cdot A^{-1} = I_n$
$\hookrightarrow B \cdot A = I_n$ $\rightarrow \begin{bmatrix} 3 & -1 \\ y & 2 \end{bmatrix} \cdot \begin{bmatrix} x & 1 \\ 5 & 3 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \rightarrow \begin{cases} 3x - 5 = 1 & I \\ xy + 10 = 0 & II \end{cases}$

I $3x - 5 = 1$
$3x = 1 + 5$
$3x = 6$
$x = \frac{6}{3} = 2$

II $xy + 10 = 0$
$2y = -10$
$y = \frac{-10}{2} = -5$

$x + y = 2 + (-5)$
$= 2 - 5 = -3$

R= altarnativa c

2. $K = ?$, $A = \begin{vmatrix} 1 & 0 & 1 \\ K & 1 & 3 \\ 1 & K & 3 \end{vmatrix}$ (det = 0)

$1 + 3K + 0 = 3K + 1$

$\det A = \begin{vmatrix} 1 & 0 & 1 \\ K & 1 & 3 \\ 1 & K & 3 \end{vmatrix} \begin{matrix} 1 & 0 \\ K & 1 \\ 1 & K \end{matrix}$

$3 + 0 + K^2 = K^2 + 3$

$= K^2 + 3 - (3K + 1)$
$= K^2 + 3 - 3K - 1$
$= K^2 - 3K + 2 = 0$

$\Delta = 9 - 4 \cdot 1 \cdot 2$
$\Delta = 9 - 8 = 1$

$K^{I} = \frac{3 + \sqrt{1}}{2 \cdot 1} = \frac{3 + 1}{2} = \frac{4}{2} = 2$

$K^{II} = \frac{3 - \sqrt{1}}{2 \cdot 1}$
$K^{II} = \frac{3 - 1}{2}$
$K^{II} = \frac{2}{2} = 1$

Resposta: altarnativa c

3. $B = A^{-1}$, $A = \begin{bmatrix} 3 & 5 \\ 2 & 4 \end{bmatrix}$ $\quad B = \begin{bmatrix} 4 & -5 \\ -2 & 3 \end{bmatrix} : 2$

$\det A = 12 - 10 = 2$

$B = \begin{bmatrix} 2 & -5/2 \\ -1 & 3/2 \end{bmatrix}$

Resposta: alternativa c

4. $\begin{bmatrix} x & 1 & 2 \\ 3 & 1 & 2 \\ 10 & 1 & x \end{bmatrix} \begin{matrix} x & 1 \\ 3 & 1 \\ 10 & 1 \end{matrix}$

$20 + 2x + 3x = 20 + 5x \qquad x^2 + 20 + 6 = x^2 + 26$

$\det = x^2 + 26 - (20 + 5x)$

$x^2 + 26 - 20 - 5x \neq 0$

$x^2 - 5x + 6 \neq 0$

$\Delta = 25 - 4.1.6$

$\Delta = 25 - 24 = 1$

$x^{I} \neq \frac{5+1}{2} \neq \frac{6}{2} = 3$

$x^{II} = \frac{5-1}{2} \neq \frac{4}{2} = 2$

$\{x \neq 3,\ x \neq 2\}$

Resposta: alternativa a

5. $A = \begin{bmatrix} -1 & -1 & 2 \\ 2 & 1 & -2 \\ 1 & 1 & -1 \end{bmatrix}$, $A + A^{-1} = ?$ $\quad \det A: \begin{bmatrix} -1 & -1 & 2 \\ 2 & 1 & -2 \\ 1 & 1 & -1 \end{bmatrix} \begin{matrix} -1 & -1 \\ 2 & 1 \\ 1 & 1 \end{matrix}$ $\quad 7 - 6 = 1$

$2 + 2 + 2 = 6 \qquad 1 + 2 + 4 = 7$

$A = \begin{bmatrix} -1 & -1 & 2 \\ 2 & 1 & -2 \\ 1 & 1 & -1 \end{bmatrix}$ $\quad A' = \begin{bmatrix} (-1-(2)) & (-2-(-2)) & (2-1) \\ (1-2) & (1-2) & (-1-(-1)) \\ (2-2) & (2-4) & (-1-(-2)) \end{bmatrix}$

$A' = \begin{bmatrix} 1 & 0 & 1 \\ 1 & -1 & 0 \\ 0 & 2 & 1 \end{bmatrix}$ $\quad \bar{A} = (A')^T = \begin{bmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix}$

$A^{-1} = \frac{\bar{A}}{1} = \begin{bmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix}$

DOM SEG TER QUA QUI SEX SÁB
DOM LUN MAR MIÉ JUE VIE SÁB

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$A+A^{-1}=\begin{bmatrix}-1 & -1 & 2\\ 2 & 1 & -2\\ 1 & 1 & -1\end{bmatrix}+\begin{bmatrix}1 & 1 & 0\\ 0 & -1 & 2\\ 1 & 0 & 0\end{bmatrix}=\begin{bmatrix}0 & 0 & 2\\ 2 & 0 & 0\\ 2 & 1 & 0\end{bmatrix}$

Resposta: alternativa b

6. $(x.A)^{t}=B$

$((x.A)^{t})^{t}=B^{t}$

$x.A=B^{t}$

$x.\underbrace{A.A^{-1}}_{1}=B^{t}.A^{-1} \rightarrow x=B^{t}.A^{-1}$

Resposta: alternativa b

7. $B=\begin{bmatrix}x\\ y\end{bmatrix}$, $C=\begin{bmatrix}4x+5y\\ 5x+6y\end{bmatrix}$, $A^{-1}=?$, $AB=C$

$A.\begin{bmatrix}x\\ y\end{bmatrix}=\begin{bmatrix}4x+5y\\ 5x+6y\end{bmatrix} \rightarrow A=\begin{bmatrix}4 & 5\\ 5 & 6\end{bmatrix}$ $\quad detA=24-25=-1$

$A^{-1}=\begin{bmatrix}6 & -5\\ -5 & 4\end{bmatrix} : -1 \rightarrow A^{-1}=\begin{bmatrix}-6 & 5\\ 5 & -4\end{bmatrix}$ Resposta: alternativa d

8. $A=\begin{bmatrix}2 & k\\ -2 & 1\end{bmatrix}$ $k=?$, $detA=detA^{-1}$

$detA=2-(-2k)=2+2k$

$detA.detA^{-1}=1$

$(2+2k)(2+2k)=1$

$4+4k+4k+4k^{2}=1$

$4k^{2}+8k+4-1=0$

$4k^{2}+8k+3=0$

$\Delta=64-4.4.3$

$\Delta=64-48=16$

$k^{I}=\frac{-8+4}{8}=\frac{-4^{:4}}{8^{:4}}=\frac{-1}{2}$ $\quad k^{II}=\frac{-8-4}{8}=\frac{12^{:4}}{8^{:4}}=\frac{-3}{2}$

$k=\frac{-1}{2}\ \frac{-3}{2}=\frac{-4}{2}=-2$ Resposta: alternativa b

SÃO DOMINGO

6. $A_{2\times 2}$, $B_{2\times 2}$, $\det A \neq 0$, $\det B \neq 0$

a. $(A+B).(A-B) = A^2 - AB + BA - B^2$ $(AB \neq BA)$

b. $(A+B)^2 = A^2 + 2AB + B^2 \rightarrow AB = BA$

c. $\frac{\det(A)}{\det(-A)}$ $\det(-A) = (-1)^2 \det A = \det$ $\frac{\det A}{\det(-A)} = 1$

d. $B = A^{-1}$ $\det A . \det B = 1 \rightarrow \det B = \frac{1}{\det A}$