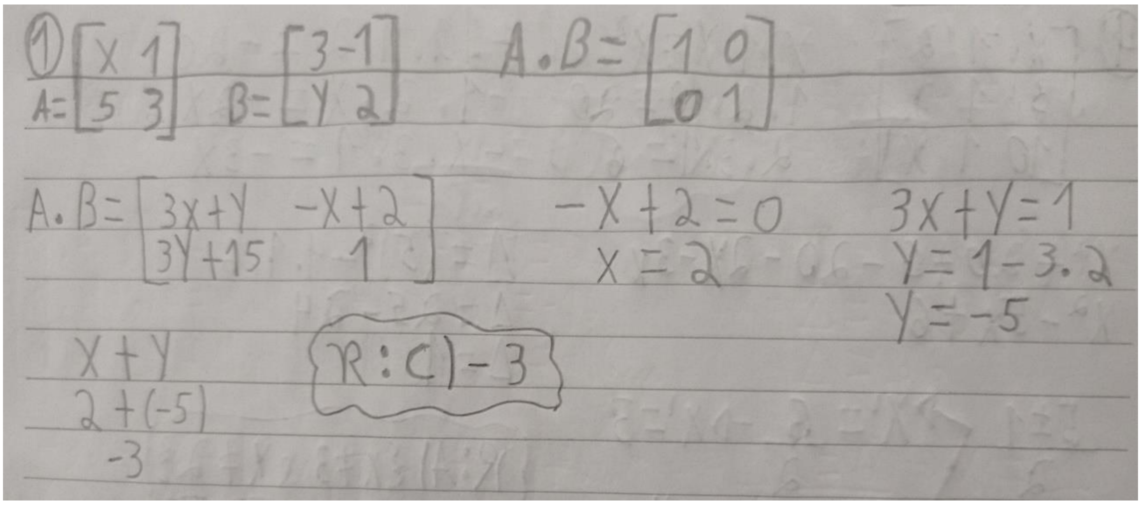
João Batista Rufino da Silva Junior. CTII 350.

Matriz Inversa:

1.



① $A=\begin{bmatrix} x & 1 \\ 5 & 3 \end{bmatrix}$ $B=\begin{bmatrix} 3 & -1 \\ y & 2 \end{bmatrix}$ $A.B=\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

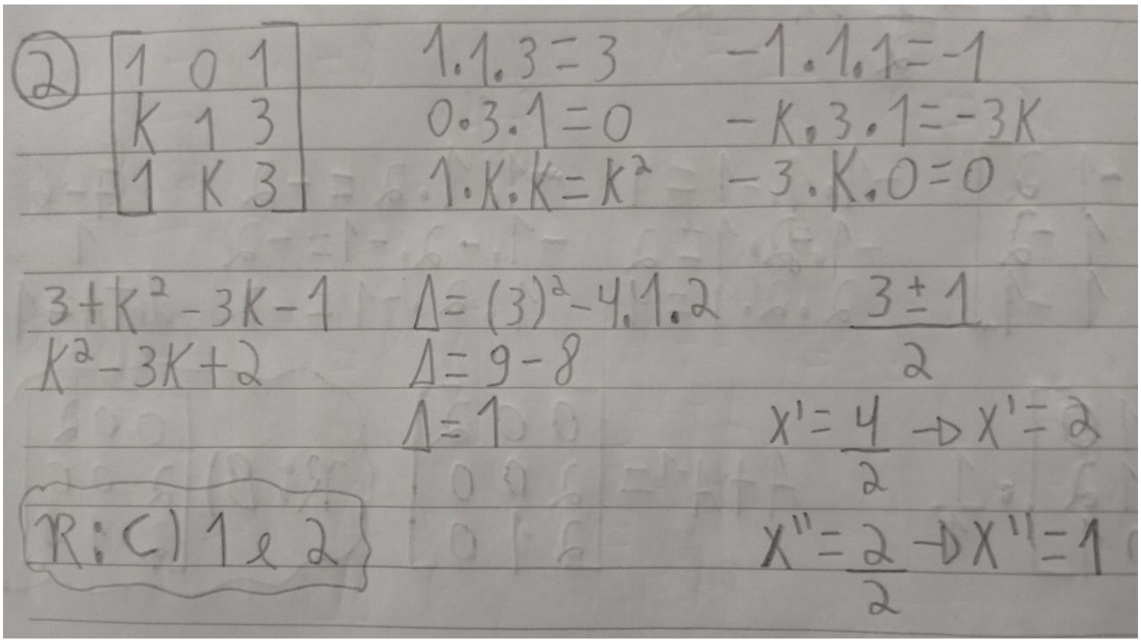
$A.B=\begin{bmatrix} 3x+y & -x+2 \\ 3y+15 & 1 \end{bmatrix}$ $-x+2=0$ $x=2$ $3x+y=1$ $y=1-3.2$ $y=-5$

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

R: C) -3

R: C) -3

2.



② $\begin{bmatrix} 1 & 0 & 1 \\ k & 1 & 3 \\ 1 & k & 3 \end{bmatrix}$ $1.1.3=3$ $0.3.1=0$ $1.k.k=k^2$ $-1.1.1=-1$ $-k.3.1=-3k$ $-3.k.0=0$

$3+k^2-3k-1$
k^2-3k+2

$\Delta=(3)^2-4.1.2$
$\Delta=9-8$
$\Delta=1$

$\frac{3\pm 1}{2}$

$x'=\frac{4}{2} \rightarrow x'=2$

$x''=\frac{2}{2} \rightarrow x''=1$

R: C) 1 e 2

R: C) 1 e 2

3.

$$③ \quad A = \begin{bmatrix} 3 & 5 \\ 2 & 4 \end{bmatrix} \qquad 3 \cdot 4 - 2 \cdot 5 = 2 \qquad \det A = 2 \qquad B = \frac{1}{2} \cdot \begin{bmatrix} 4 & -5 \\ -2 & 3 \end{bmatrix}$$

$$B = \begin{bmatrix} 2 & -5/2 \\ -1 & 3/2 \end{bmatrix} \qquad \boxed{R: C) \begin{bmatrix} 2 & \frac{-5}{2} \\ -1 & \frac{3}{2} \end{bmatrix}}$$

R: C)

4.

$$④ \begin{bmatrix} x & 1 & 2 \\ 3 & 1 & 2 \\ 10 & 1 & x \end{bmatrix} \qquad \begin{array}{ll} x \cdot 1 \cdot x = x^2 & -10 \cdot 1 \cdot 2 = -20 \\ 1 \cdot 2 \cdot 10 = 20 & -1 \cdot 2 \cdot x = -2x \\ 2 \cdot 3 \cdot 1 = 6 & -x \cdot 3 \cdot 1 = -3x \end{array}$$

$$x^2 + 20 + 6 - 20 - 2x - 3x \qquad \Delta = (5)^2 - 4 \cdot 1 \cdot 6$$

$$x^2 - 5x + 6 \qquad \Delta = 25 - 24$$

$$\Delta = 1$$

$$\frac{5 \pm 1}{2} \quad \begin{array}{l} \rightarrow x' = \frac{6}{2} \rightarrow x' = 3 \\ \rightarrow x'' = \frac{4}{2} \rightarrow x'' = 2 \end{array} \qquad \boxed{R: A) \{x \neq 3 \text{ e } x \neq 2\}}$$

R: A) {x≠3 e x≠2}

5.

⑤ $A=\begin{bmatrix}-1 & -1 & 2\\ 2 & 1 & -2\\ 1 & 1 & -1\end{bmatrix}$

$-1.1.-1=1$ $\quad -1.1.2=-2$ $\quad 7-6$

$-1.-2.1=2$ $\quad -1.-2.-1=-2$ $\quad 1$

$2.2.1=4$ $\quad 1.2.-1=-2$ $\quad \det A=1$

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

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

R: B) $\begin{bmatrix}0 & 0 & 2\\ 2 & 0 & 0\\ 2 & 1 & 0\end{bmatrix}$

R: B)

6.

⑥ $(XA)^t=B \quad .t$

$((XA)^t)^t=B^t$

$XA=B^t\cdot A^{-1}$

$XA\cdot A^{-1}=B^tA^{-1}$

$1X=B^t\cdot A^{-1}$

$X=B^t\cdot A^{-1}$

R: B) $X=B^t\cdot A^{-1}$

R: B) $X=B^t.A^{-1}$

7.

7 $B=\begin{bmatrix}X\\Y\end{bmatrix}$ $C=\begin{bmatrix}4X+5Y\\5X+6Y\end{bmatrix}$ $AB=C \to A=\frac{C}{B}$

$A=\begin{bmatrix}4&5\\5&6\end{bmatrix}$ $4.6-5.5=-1$ $\det A=-1$ $A^{-1}=\frac{1}{-1}\cdot\begin{bmatrix}6&-5\\-5&4\end{bmatrix}$

$A^{-1}=\begin{bmatrix}-6&5\\5&-4\end{bmatrix}$ R: D) $\begin{bmatrix}-6&5\\5&-4\end{bmatrix}$

R: D)

8.

8 $A=\begin{bmatrix}2&K\\-2&1\end{bmatrix}$ $2.1-(-2).K=2K+2$ $\det A=2K+2$ $A^{-1}=\begin{bmatrix}1&-K\\2&2\end{bmatrix}$ $2.1-2.-K$ $\det A^{-1}=2K+2$

$2K+2=0 \to 2K=-2 \to K=\frac{-2}{2} \to K=-1$

$K+K=-1+(-1) \to K+K=-2$

R: B) -2

R: B) -2

9. a)

9 a) $(A+B).(A-B)$ R: $A^2-A.B+B.A-B^2$ ou A^2-B^2

R: A^2 - AB + BA - B^2 ou A^2 - B^2

b)

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

$$\cancel{A^2} + \cancel{AB} + BA + \cancel{B^2} = \cancel{A^2} + \cancel{2}AB + \cancel{B^2}$$

$$\boxed{R:\ BA = AB \quad AB = BA}$$

R: AB = BA ou BA = AB

c)

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

$$\boxed{R: 1}$$

R: 1

d)

$$d)\ \det AB = 1 \rightarrow \det A \cdot \det B = 1$$

$$\det B = \frac{1}{\det A}$$

$$\boxed{R: \det B = \frac{1}{\det A}}$$

R: det B = 1/det A