Lista de Exercícios

1-

$A = \begin{vmatrix} 1 & a & 0 \\ 0 & 1 & 0 \\ 0 & -1 & 1 \end{vmatrix}$

DetA = 1 - (-1)
DetA = 1 + 1

DetA = 2

$B = \begin{vmatrix} 1 & 0 & 0 & 3 \\ a & 1 & -1 & 4 \\ 0 & 0 & 0 & 3 \\ 0 & 1 & 1 & 4 \end{vmatrix}$

+ 1 · cof (b₁₁)
a · cof (b₂₁)
0 · cof (b₃₁)
0 · cof (b₄₁)

fila escolhida

1 · cof (b₁₁)

1+1 = 2

PAR

(mantém o sinal)

$\begin{vmatrix} 1 & -1 & 4 & 1 & -1 \\ 0 & 0 & 3 & 0 & 0 \\ 1 & 1 & 4 & 1 & 1 \end{vmatrix}$

0 + 3 + 0

0 + (-3) + 0

-3 - (+3)
-3 - 3

-6

a · cof (b₂₁)

2+1 = 3

(ímpar)

(inverte o sinal)

$\begin{vmatrix} 0 & 0 & 3 & 0 & 0 \\ 0 & 0 & 3 & 0 & 0 \\ 1 & 1 & 4 & 1 & 1 \end{vmatrix}$

0 + 0 + 0

0 + 0 + 0

0

det B = 1 · (-6) + (a) · (0)
det B = -6 + 0
det B = -6

$2-$

x^2	0	x	$-\frac{1}{10}$
7,5	0	5	2
10	0	4	2
1	1	1	1

$= 0$

$\frac{-1}{10} \cdot \frac{75}{30} \cdot \frac{4}{1} = \frac{-300}{100} = \frac{-3}{1}$

$\frac{-1}{10} \cdot \frac{10}{1} \cdot \frac{5}{1} = \frac{-50}{10} = \frac{-5}{1}$

$\downarrow 1 \cdot cof(a_{42}) =$

v

par

$-5 + 8x^2 + 15x \longrightarrow 8x^2 + 15x - 5$

x^2	x	$-\frac{1}{10}$	x^2	x
7,5	5	2	7,5	5
10	4	2	10	4

$10x^2 + 20x - 3$

$10x^2 + 20x - 3 - (8x^2 + 15x - 5) = 0$

$10x^2 + 20x - 3 - 8x^2 - 15x + 5 = 0$

$10x^2 - 8x^2 + 20x - 15x - 3 + 5 = 0$

$2x^2 + 5x + 2 = 0$

$a = 2$

$b = 5$

$c = 2$

$\Delta = b^2 - 4ac$

$\Delta = 5^2 - 4 \cdot 2 \cdot 2$

$\Delta = 25 - 16$

$\Delta = 9$

$X = \frac{-b \pm \sqrt{\Delta}}{2 \cdot a}$

$x = \frac{-(5) \pm \sqrt{9}}{2 \cdot 2} \longrightarrow x = \frac{-5 \pm 3}{4}$

$x' = \frac{-5 - 3}{4} = \frac{-8}{4} = \boxed{-2}$

$x'' = \frac{-5 + 3}{4} = \frac{-2 \div 2}{4 \div 2} = \boxed{\frac{-1}{2}}$

$x = -2$

ou

$x = -\frac{1}{2}$

$3 -$
$$\begin{vmatrix} x & 0 & 0 & 3 \\ -1 & x & 0 & 0 \\ 0 & -1 & x & 1 \\ 0 & 0 & -1 & -2 \end{vmatrix}$$

$\begin{cases} x \cdot cof(a_{15}) \\ -1 \cdot cof(a_{25}) \\ 0 \cdot \cancel{cof(a_{35})} \\ 0 \cdot \cancel{cof(a_{45})} \end{cases}$

$\underline{x \cdot cof(a_{15})} =$
  $\vee$
  PAR

$$\begin{array}{ccc|cc} x & 0 & 0 & x & 0 \\ -1 & x & 1 & -1 & x \\ 0 & -1 & -2 & 0 & -1 \end{array}$$

$0 + (-x) + 0 \qquad + \quad -x$

$-2x^2 + 0 + 0 \; + -2x^2$

$\begin{cases} -2x^2 - (-x) \\ \quad \vee \\ -2x^2 + x \end{cases}$

$-1 \cdot cof(a_{25}) =$
  $\vee$
  ímpAR

$\rightarrow$ Invente
  o SinAl

$$\begin{array}{ccc|cc} 0 & 0 & 3 & 0 & 0 \\ -1 & x & 1 & -1 & x \\ 0 & -1 & -2 & 0 & -1 \end{array}$$

$0 + 0 + 0 \quad + 0$

$0 + 0 + 3 + 3$

$\begin{cases} 3 - 0 \\ \quad \vee \\ 3 \end{cases}$

$3 \xrightarrow{(2+1)}$ ímpAR $\begin{pmatrix} \text{Invente o} \\ \text{SinAl} \end{pmatrix}$

3
$\downarrow$
-3

$x \cdot (-2x^2 + x) + (-1) \cdot (-3)$
  $\vee$

$-2x^3 + x^2 + 3 \quad \rightarrow \text{Alternativa } A$

4-

$$
\begin{array}{ccccc|l}
x & 1 & 0 & 0 & 0 & X \cdot cof(a_{11}) \\
0 & x & 1 & 0 & 0 & 0 \cdot cof(a_{21}) \\
0 & 0 & x & 1 & 0 & 0 \cdot cof(a_{31}) \\
0 & 0 & 0 & x & k & 0 \cdot cof(a_{41}) \\
0 & 0 & 0 & 1 & x & 0 \cdot cof(a_{51})
\end{array}
$$

Fila escogida

$$
+ X \cdot
\begin{array}{cccc|l}
x & 1 & 0 & 0 & X \cdot cof(a_{11}) \\
0 & x & 1 & 0 & 0 \cdot cof(a_{21}) \\
0 & 0 & x & k & 0 \cdot cof(a_{31}) \\
0 & 0 & 1 & x & 0 \cdot cof(a_{41})
\end{array}
$$

Fila escogida

$$X \cdot \left(x
\begin{array}{cccc}
x & 1 & 0 & \\
0 & x & k & 0 & x \\
0 & 1 & x & 0
\end{array}
\right)
$$

$0 + kx + 0 \quad \longrightarrow kx \Big\} \; x^3 - (kx)$

$x^3 + 0 + 0 \quad \longleftarrow + x^3 \Big\} \; x^3 - kx$

$det\,A = x \cdot (x \cdot (x^3 - kx))$

$det\,A = x^2 \,(x^3 - kx)$

$det\,A = x^5 - kx^3$

$f(x) = det\,A$

$f(x) = x^5 - kx^3$

$f(-2) = 8$

$-2^5 - k \cdot (-2)^3 = 8$

$-32 - k \cdot (-8) = 8$

$-32 + 8k = 8$

$8k = 8 + 32$

$8k = 40$

$k = \dfrac{40}{8}$

Alternativa D $\qquad \longleftarrow K = 5$