Tarefa Básica

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01. Calcule os determinantes das seguintes matrizes

$1.3=3$

a) $\begin{bmatrix} 2 & 3 \\ 1 & 5 \end{bmatrix} = 10-3=7$ //

$2.5=10$

$3.(-4)=-12$

b) $\begin{bmatrix} -2 & -4 \\ 3 & 6 \end{bmatrix} = -12-(-12) = -12+12=0$ //

$6.(-2)=-12$

$1-12+4=-7$

c) $\begin{bmatrix} 3 & -1 & 1 \\ 2 & 1 & -1 \\ 1 & 4 & -2 \end{bmatrix} \begin{matrix} 3 & -1 \\ 2 & 1 \\ 1 & 4 \end{matrix} = 3-(-7) = 3+7=10$ //

$-6+1+8=3$

$-3+3+16=16$

d) $\begin{bmatrix} 3 & 2 & -1 \\ 2 & 3 & 1 \\ 1 & 1 & 4 \end{bmatrix} \begin{matrix} 3 & 2 \\ 2 & 3 \\ 1 & 1 \end{matrix} = 36-16=20$ //

$36+2-2=36$

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02. (MACK) Se $A=(a_{ij})$ é uma matriz quadrada de terceira ordem tal que

$a_{ij} = \begin{cases} -3, \text{ se } i=j \\ 0, \text{ se } i \neq j \end{cases}$ então o determinante de A vale:

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$$0+0+0=0$$

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix} = \begin{bmatrix} -3 & 0 & 0 \\ 0 & -3 & 0 \\ 0 & 0 & -3 \end{bmatrix} \begin{matrix} -3 & 0 \\ 0 & -3 \\ 0 & 0 \end{matrix} = -27-0=-27//$$

$$-27+0+0=-27$$

R: Alternativa $\Rightarrow$ (A) -27.

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03. (FUVEST) Resolver a equação

$$x^2+12x+9$$

$$\begin{vmatrix} x & 1 & x \\ 3 & x & 4 \\ 1 & 3 & 3 \end{vmatrix} = -3 \qquad \begin{vmatrix} x & 1 & x \\ 3 & x & 4 \\ 1 & 3 & 3 \end{vmatrix} \begin{matrix} x & 1 \\ 3 & x \\ 1 & 3 \end{matrix}$$

$$3x^2+4+9x$$

$$3x^2+4+9x-x^2-12x-9=-3$$

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

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

$$\Delta = (-3)^2-4.2.(-2)$$

$$\Delta = 9+16$$

$$\Delta = 25$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2.a}$$

$$x' = \frac{-(-3)+5}{2.2} = \frac{8}{4} = 2//$$

$$x'' = \frac{-(-3)-5}{2.2} = \frac{-2 \div 2}{4 \div 2} = \frac{-1}{2}//$$

R: Alternativa (E)//

04.(MACK) A soma das raízes da equação é:

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

$$\left|\begin{matrix} x-1 & -1 & 0 \\ 0 & x+1 & -1 \\ 2 & -1 & x+1 \end{matrix}\right|\begin{matrix} x-1 & -1 \\ 0 & x+1 \\ 2 & -1 \end{matrix} = 2$$

$$(x+1)^2(x-1) + \cancel{2} - (x-1) = \cancel{2}$$
$$(x-1)((x+1)^2 - 1) = 0$$

$x-1=0$ $\quad (x+1)^2 = 1$ $\quad \to x = 0$ //

$\boxed{x=1}$ // $\quad x+1 = \pm 1$

$\to x = -2$ //

R: $1+0+(-2) = -1$ //, Alternativa (C).

05.(UEL) Sejam as matrizes $A=(a_{ij})_{3x2}$, tal que, $a_{ij} = 2i-3j$ e $B=(b_{ik})_{2x3}$, tal que $b_{jk} = k-j$. O determinante da matriz A.B é igual a

$A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \\ a_{31} & a_{32} \end{bmatrix}$ $\quad a_{ij} = 2i-3j$ $\quad A = \begin{bmatrix} -1 & -4 \\ 1 & -2 \\ 3 & 0 \end{bmatrix}$.

$B = \begin{bmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \end{bmatrix}$ $\quad b_{jk} = k-j = b = \begin{bmatrix} 0 & -1 & -2 \\ 1 & 0 & -1 \end{bmatrix}$

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$3\times 2 \quad 2\times 3$

$$B = \begin{bmatrix} 0 & -1 & -2 \\ 1 & 0 & 1 \end{bmatrix}$$

$$A = \begin{bmatrix} -1 & -4 \\ 1 & -2 \\ 3 & 0 \end{bmatrix} \quad A.B = \begin{bmatrix} 0-4 & 1-0 & 2-4 \\ 0-2 & -1-0 & -2-2 \\ 0-0 & -3+0 & -6+0 \end{bmatrix} = \begin{bmatrix} -4 & 1 & -2 \\ -2 & -1 & -4 \\ 0 & -3 & -6 \end{bmatrix}$$

$0-48+12=-36$

$$AB = \begin{bmatrix} -4 & 1 & -2 \\ -2 & -1 & -4 \\ 0 & -3 & -6 \end{bmatrix} \begin{matrix} -4 & 1 \\ -2 & -1 \\ 0 & -3 \end{matrix} = -36-(-36) = -36+36 = 0$$

$-24+0-12=-36$

R: Alternativa (C) = 0

06. Dadas as Matrizes

$$A = \begin{bmatrix} 2 & 0 & -1 \\ -1 & 1 & 0 \end{bmatrix} \text{ e } B = \begin{bmatrix} 1 & -1 \\ -1 & 1 \\ 0 & 2 \end{bmatrix},$$

O determinante da matriz A.B é igual a

$$B = \begin{bmatrix} 1 & -1 \\ -1 & 1 \\ 0 & 2 \end{bmatrix} \quad 2\times 3 \quad 3\times 2$$

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

$$A.B = \begin{bmatrix} 2-0-0 & -2+0-2 \\ -1-1+0 & 1+1+0 \end{bmatrix} = \begin{bmatrix} 2 & -4 \\ -2 & 2 \end{bmatrix}$$

$$\begin{bmatrix} 2 & -4 \\ -2 & 2 \end{bmatrix} \begin{matrix} -8 \\ \\ 4 \end{matrix} = 4-8 = -4$$

R: Alternativa $\Rightarrow$ (D) -4

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