Exercícios: Teorema de Laplace

Calcule o determinante de cada matriz:

1. $\begin{vmatrix} 0 & 1 & 1 & 0 \\ 1 & 1 & 2 & 3 \\ 1 & 3 & -1 & 4 \\ 2 & 0 & 5 & 4 \end{vmatrix} =$

2. $\begin{vmatrix} 1 & 2 & 3 & 4 \\ 0 & 0 & 5 & 0 \\ 6 & 7 & 8 & 0 \\ 0 & 0 & 9 & 10 \end{vmatrix} =$

3. $\begin{vmatrix} 1 & 0 & 0 & 0 \\ 2 & 2 & 0 & 0 \\ 3 & 2 & 1 & 0 \\ 4 & 2 & 3 & -2 \end{vmatrix} =$

4. Calcule o x:

$$\begin{vmatrix} x^2 & 0 & x & -1 \\ 3 & 0 & 2 & 8 \\ 5 & 0 & 2 & 10 \\ 1 & 1 & 1 & 10 \end{vmatrix} = 0$$

5. Para que valores de m a matriz $\begin{pmatrix} 0 & 1 & 2 & m \\ 0 & 1 & 0 & 2 \\ 0 & 2 & 0 & m \\ m & 0 & 1 & 2 \end{pmatrix}$ tem determinante diferente de zero?

6. Dadas as matrizes $A = \begin{bmatrix} x^2 & 1 \\ 1 & 2x \end{bmatrix}, B = \begin{bmatrix} 0 & x & 1 \\ 1 & -1 & x \\ x & 1 & 0 \end{bmatrix}$ $e\ C = \begin{bmatrix} 1 & 0 & 1 & x \\ 2 & 3 & 4 & 5 \\ x & 0 & 1 & 0 \\ 0 & 0 & x & 1 \end{bmatrix}$, calcule o valor de x para que se tenha $\det A + \det B = \det C$.

Gabarito:

1. -7
2. 250
3. -4
4. $x = -2\ ou\ x = -1/2$
5. $m \neq 0\ e\ m \neq 4$
6. $x = 3/4$