

# Determinanten - Eigenschaften - Torrey Bönner

1- 
$$\begin{vmatrix} P & 2 & 2 & P & 2 \\ P & 4 & 4 & P & 2 \\ P & 4 & 1 & P & 4 \end{vmatrix}$$

$$8P + 16P + 2P$$

$$20P - 26P = -18 - 16P$$

$$-6P + -18P - (-16P)$$

$$-18 = 6P$$

$$\frac{-18}{6} = P$$

$$-3 = P$$

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

$$\rightarrow \det = -30 + 39$$

$$\det = 9$$

$$-6 - 12 - 12$$

(E)

2-  $A_{4 \times 4}$

$$\det A = -6$$

$$x = ?$$

$$\det(2A) = x - 97$$

$$2^4 \cdot (-6) = x - 97$$

$$16 \cdot (-6) = x - 97$$

$$x = 97 - 96$$

$$x = 1$$

(C)

3-  $A = \begin{pmatrix} a & b & c \\ d & e & f \\ g & h & i \end{pmatrix} \cdot \frac{1}{x}$

$$\left(\frac{1}{x}\right) \cdot Y \cdot \det A$$

$$\left(\frac{x}{y}\right) \cdot \det A$$

$$\det A \div \left(\frac{x}{y}\right)$$

(C)

4-

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

$$-4k + k + 0 - 2k = 10$$

$$-5k = 10$$

$$k = \frac{10}{-5}$$

$$k = -2$$

$$\begin{vmatrix} 2 & 1 & 0 & 2 & 1 \\ (-2+4) & (-2+3) & (-2+1) & (-2+4) & (-2+3) \\ 1 & 2 & -2 & 1 & 2 \end{vmatrix}$$

$$\det = -7 + 16$$

$$\det = 9$$

(C)



5- Letra D, como as filas  $L'$  e  $L''$  são combinações lineares das outras duas.  
ou seja:

$$2 \cdot (L') + (L'') = L_1$$

$$\begin{pmatrix} C1 & C2 & C3 \\ 1 & -11 & 6 \\ -2 & 4 & -3 \\ -3 & -7 & 2 \end{pmatrix}$$

$$6 \cdot 2 - 11 = 1$$

$$(-3) \cdot 2 + 4 = -2$$

$$2 \cdot 2 - 7 = -3$$

$C = \text{Coluna}$

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

$$6- \begin{vmatrix} 1 & x & x^2 \\ 1 & 2 & 4 \\ 1 & -3 & 9 \end{vmatrix}$$

$$\det = -5x^2 - 5x + 30$$

$$18 + 4x - 3x^2$$

$$\Delta = 25 + 600$$

$$\Delta = 625$$

$$\sqrt{625} = 25$$

$$V = \{-3, 2\}$$

$$x = \frac{5 \pm 25}{2 \cdot -5} \begin{cases} x_1 = -3 \\ x_2 = 2 \end{cases}$$

$$7- \begin{vmatrix} 1 & 0 & 0 & 0 & 0 \\ 2 & 2 & 0 & 0 & 0 \\ 3 & 2 & 1 & 0 & 0 \\ 4 & 2 & 3 & -2 & 0 \\ 5 & 1 & 2 & 3 & 3 \end{vmatrix}$$

Matriz triangular

$$\det = 1 \cdot 2 \cdot 1 \cdot -2 \cdot 3$$

$$\det = -12$$

(D)