

Soluciones examen 4

Estudia i resol el sistema

$$\begin{cases} 2x + 3y + 4z = 5 \\ x - y + 8z = 1 \\ x + 3y + 5z = 2 \end{cases}$$

$$A = \begin{pmatrix} 2 & 3 & 4 \\ 1 & -1 & 8 \\ 1 & 3 & 5 \end{pmatrix} \text{ i } B = \begin{pmatrix} 2 & 3 & 4 & 5 \\ 1 & -1 & 8 & 1 \\ 1 & 3 & 5 & 2 \end{pmatrix}$$

RangA?

$$\det A = 2 \cdot (-29) - 1 \cdot (3) + 1 \cdot (28) = -33. \text{ Aleshores } \begin{cases} \text{Rang} A = 3 \\ \text{Rang} B = 3 \\ n = 3 \end{cases}$$

Les solucions seran

$$x = \frac{\begin{vmatrix} 5 & 3 & 4 \\ 1 & -1 & 8 \\ 2 & 3 & 5 \end{vmatrix}}{\begin{vmatrix} 2 & 3 & 4 \\ 1 & -1 & 8 \\ 1 & 3 & 5 \end{vmatrix}} = \frac{-92}{-33} \quad y = \frac{\begin{vmatrix} 2 & 5 & 4 \\ 1 & 1 & 8 \\ 1 & 2 & 5 \end{vmatrix}}{\begin{vmatrix} 2 & 3 & 4 \\ 1 & -1 & 8 \\ 1 & 3 & 5 \end{vmatrix}} = \frac{-3}{-33}$$

$$z = \frac{\begin{vmatrix} 2 & 3 & 5 \\ 1 & -1 & 1 \\ 1 & 3 & 2 \end{vmatrix}}{\begin{vmatrix} 2 & 3 & 4 \\ 1 & -1 & 8 \\ 1 & 3 & 5 \end{vmatrix}} = \frac{7}{-33}$$

$$\begin{cases} x - y + z = 4 \\ x + 2y + 4z = 3 \\ 2x + y + 5z = 7 \end{cases}$$

$$A = \begin{pmatrix} 1 & -1 & 1 \\ 1 & 2 & 4 \\ 2 & 1 & 5 \end{pmatrix} \text{ i } B = \begin{pmatrix} 1 & -1 & 1 & 4 \\ 1 & 2 & 4 & 3 \\ 2 & 1 & 5 & 7 \end{pmatrix}$$

RangA?

$\det A = 0$.

2

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

Rang B?

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

$$\text{Aleshores } \begin{cases} \text{Rang}A = 2 \\ \text{Rang}B = 2 \\ n = 3 \end{cases}$$

Per tant, estem davant un sistema compatible indeterminat amb un grau de llibertat (z).

Les solucions seran

$$\begin{cases} x - y = 4 - z \\ x + 2y = 3 - 4z \end{cases}$$

$$x = \frac{\begin{vmatrix} 4 - z & -1 \\ 3 - 4z & 2 \end{vmatrix}}{\begin{vmatrix} 1 & -1 \\ 1 & 2 \end{vmatrix}} = \frac{11 - 6z}{3} \quad y = \frac{\begin{vmatrix} 1 & 4 - z \\ 1 & 3 - 4z \end{vmatrix}}{\begin{vmatrix} 2 & 3 \\ 1 & -1 \end{vmatrix}} = \frac{-1 - 3z}{3}$$

$$\begin{cases} x + y + z = 3 \\ x - y + 4z = 1 \\ 2x + 5z = 7 \end{cases}$$

$$A = \begin{pmatrix} 1 & 1 & 1 \\ 1 & -1 & 4 \\ 2 & 0 & 5 \end{pmatrix} \text{ i } B = \begin{pmatrix} 1 & 1 & 1 & 3 \\ 1 & -1 & 4 & 1 \\ 2 & 0 & 5 & 7 \end{pmatrix}$$

RangA?

$\det A = 0$.

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

Rang B?

$$\begin{vmatrix} 1 & 1 & 3 \\ 1 & -1 & 1 \\ 2 & 0 & 7 \end{vmatrix} = -4 - 4 + 2 \cdot 7 = 0,$$

pdfMachine - is a pdf writer that produces quality PDF files with ease!
Get yours now!

"Thank you very much! I can use Acrobat Distiller or the Acrobat PDFWriter but I consider your product a lot easier to use and much preferable to Adobe's" A.Sarras - USA

$$\text{Aleshores } \left\{ \begin{array}{l} \text{Rang}A = 2 \\ \text{Rang}B = 3 \\ n = 3 \end{array} \right.$$

Per tant, estem davant un sistema incompatible

pdfMachine - is a pdf writer that produces quality PDF files with ease!
Get yours now!

"Thank you very much! I can use Acrobat Distiller or the Acrobat PDFWriter but I consider your product a lot easier to use and much preferable to Adobe's" A.Sarras - USA