

## Tarefa Básica 7

$$1- \begin{cases} ax + 4y = 1 \\ x + 2y = 0 \end{cases}$$

$$a) \begin{pmatrix} a & 4 & 1 \\ -2 & 1 & 2 \end{pmatrix} \sim \begin{pmatrix} a-2 & 0 & 0 \\ 0 & 2 & 0 \end{pmatrix} \quad \begin{matrix} (a-2)x = 0 \\ x = 0 \\ a-2 \end{matrix} \quad \begin{matrix} \text{Falso} \\ \times \end{matrix}$$

$$b) \begin{matrix} x = 0 \\ a-2 & 2-2 & 0 \end{matrix} = 0 = 0 = 0 \quad \left. \vphantom{\begin{matrix} x = 0 \\ a-2 & 2-2 & 0 \end{matrix}} \right\} \text{ indeterminado} \quad \checkmark \text{ Verdadeiro}$$

c) se  $a \neq 2$ , é uma solução única, apresenta mais de um valor  $\times$  Falso

d) se  $a = 2$ , apresenta várias soluções.  $\times$  Falso

e) com  $a = 2$ , é indeterminado  $\times$  Falso

2-

I-)

$$-x \begin{pmatrix} 1 & k & 1 \\ k & 1 & 1-k \end{pmatrix}$$

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

$y = \frac{1-k^2}{1-2k}$  } não pode ser dividido por 0  
nenhum número pode ser dividido por 0

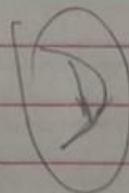
II-)

$$k = 0,5$$

$$y = \frac{1-0,5^2}{1-2 \cdot 0,5} = \frac{0,75}{0}$$

III-)

$k \neq 0,5 \rightarrow$  S.P. determinada (mais de 1 valor para  $k$ )



3-)

A-)

$$A = \begin{pmatrix} 1 & 2 & c \\ 0 & 1 & 1 \\ 3 & 2 & 2 \end{pmatrix}$$

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

$$3c + 24$$

$$A = \begin{vmatrix} 1 & 2 & c & 1 & 2 \\ 0 & 1 & 1 & 0 & 1 \\ 3 & 2 & 2 & 3 & 2 \end{vmatrix}$$

$$24c + 0$$

$$8 - (3c + 2)$$

$$\det A = 6 - 3c$$

$$3b-) \begin{pmatrix} 1 & 2 & c & | & 1 \\ 0 & 1 & 1 & | & 2 \\ 3 & 2 & 2 & | & -1 \end{pmatrix} \sim \begin{pmatrix} 1 & 0 & c-2 & | & -3 \\ 0 & 1 & 1 & | & 2 \\ 3 & 0 & 0 & | & -5 \end{pmatrix} \sim \begin{pmatrix} 1 & 0 & c-2 & | & -3 \\ 0 & 1 & 1 & | & 2 \\ 0 & 0 & -3c-6 & | & 4 \end{pmatrix}$$

$$Z = \frac{4}{-3c-6} \quad \cdot \quad c = 2 \rightarrow -3-2-6=0$$

$c$  deve ser  $\neq 2$  para  
ter 1 solução

2464 0

4-

$$\begin{pmatrix} 1 & -1 & 0 & : & k \\ -12 & 12 & -k & 1 & : & 1 \\ -36 & 36 & 0 & k & : & 2 \end{pmatrix} \sim \begin{pmatrix} 1 & -1 & 0 & : & k \\ 0 & -k+12 & 1 & : & 1-12k \\ 0 & 36 & k & : & 2-36k \end{pmatrix} \sim \begin{pmatrix} 1 & -1 & 0 & : & k \\ 0 & -k+12 & 1 & : & 1-12k \\ 0 & k^2-12k+36 & 0 & : & 2-12k^2-37k \end{pmatrix}$$

$$y = 12k^2 = 37k + 2$$

$$k^2 - 12k + 36 \neq 0$$

$$\begin{array}{rcl} 6 & + & 6 \\ \hline 6 & \cdot & 6 \end{array} = \begin{array}{rcl} 12 & & \\ \hline 36 & & \end{array}$$

$$\boxed{k \neq 6}$$

$$\boxed{\in}$$



$$5- \begin{pmatrix} 1 & -1 & 1 & 1 & -1 \\ 2 & 1 & -1 & 2 & 1 \\ 1 & 2 & -1 & 1 & 2 \end{pmatrix}$$

$$D = -1 + 1 + 4 - 1 - 2 + 2$$

$$D = 3$$

$$-5 - 12 - 3 = -20$$

$$1) x = \begin{pmatrix} -6 & -1 & 1 & 6 & -1 \\ -3 & 1 & -1 & -3 & 1 \\ -5 & 2 & -1 & -5 & 2 \end{pmatrix}$$

$$1) x = -17 - 20 = 3$$

$$-6 - 5 - 6 = -17$$

$$-3 + 5 - 12 = -10$$

$$1) y = \begin{pmatrix} 1 & 6 & 1 & 1 & 6 \\ 2 & -3 & -1 & 2 & -3 \\ 1 & -5 & -1 & 1 & -5 \end{pmatrix}$$

$$2 - 3 - 1 + 2 - 3 = -3$$

$$1 - 5 - 1 + 1 - 5$$

$$3 - 6 - 10 = -13$$

$$6 - 6 + 10 = 10$$

$$1) z = \begin{pmatrix} 1 & -1 & 6 & 1 & -1 \\ 2 & 1 & -3 & 2 & 1 \\ 1 & 2 & -5 & 1 & 2 \end{pmatrix}$$

$$22 - 10 = 12$$

$$-5 + 3 + 24 = 22$$

$$x = \frac{D_x}{D} = \frac{3}{3} = 1$$

$$D = 3$$

$$y = \frac{D_y}{D} = \frac{-3}{3} = -1$$

$$D = 3$$

$$z = \frac{D_z}{D} = \frac{12}{3} = 4$$

$$D = 3$$

$$x, y, z$$

$$1, -1, 4 = 4$$

$$B$$

$$6- \begin{pmatrix} 1 & 1 & 1 & k \\ k & 1 & 1 & 1 \\ 1 & 1 & -1 & k \end{pmatrix} \sim \begin{pmatrix} 1 & 1 & 1 & k \\ 0 & 1-k & 1-k & 1-k^2 \\ 0 & 0 & -2 & 0 \end{pmatrix}$$

$$-2z = 0$$

$$z = 0$$

$$-2$$

$$(1-k)y + (1+k) \cdot 0 = 1-k^2$$

$$(1-k)y = 1-k^2$$

$$y = \frac{1-k^2}{1-k} \rightarrow 1-k^2 = 0$$

$$1-k^2$$

$$k^2 = 1$$

$$k = 1$$

$$1-k = 0$$

$$k = 1$$

$$D$$

7-  $x + y + z = 1$

$mx - 2y + 4z = 5$

$m^2x + 4y + 16z = 25$

$$\begin{array}{r} -2m^2 + 16 + 16m \\ 1 \quad 1 \quad 1 \quad 1 \quad 1 \\ m \quad -2 \quad 4 \quad m \quad -2 \\ m^2 \quad 4 \quad 16 \quad m^2 \quad 4 \\ -32 + 4 \cdot m^2 + 4m \end{array}$$

$$\begin{array}{l} -32 + 4m^2 + 4m + 2m^2 + 16 + 16m \\ -16 + 20m + 6m^2 // 6m^2 + 20m - 16 \\ m^2 - 4 \cdot a \cdot b \\ 20^2 - 4 \cdot 6 \cdot -16 \\ 400 - 384 = \sqrt{16} = 4 \end{array}$$

$$\frac{20 \pm 4}{12} \rightarrow \boxed{2} \quad \boxed{1,33}$$

**B**



## Tarefa básica 8

1-  $\begin{bmatrix} 1 & 7 \\ 7 & 1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = k \cdot \begin{bmatrix} x \\ y \end{bmatrix}, k \in \mathbb{R}$

$$\begin{bmatrix} x+7y \\ 7x+y \end{bmatrix} = \begin{bmatrix} xk \\ yk \end{bmatrix} \quad \begin{cases} x+7y = kx \\ 7x+y = ky \end{cases}$$

$$\left( \begin{array}{cc|c} 1 & 7 & k \\ 7 & 1 & k \end{array} \right) \sim \left( \begin{array}{cc|c} 1 & 7 & k \\ 0 & -48 & -6k \end{array} \right)$$

$$\begin{array}{l|l} -48y = -6k & x+7y = kx \\ y = \frac{-6k}{-48} \div 6 & x+yy = 8y \\ y = \frac{-k}{-8} \times (-1) & x = 8y - 7y \\ & x = y = 1 \end{array}$$

$$\begin{array}{l} y = k = k = 8y \\ 8 \quad k = 8 \cdot 1 \\ \boxed{k = 8} \end{array}$$

$$\boxed{1 \in}$$

2-  $\begin{cases} 3x+4y-z=0 \\ 2x-y+3z=0 \\ x+y+z=0 \end{cases} \quad \left( \begin{array}{ccc|c} 3 & 4 & -1 & 0 \\ 2 & -1 & 3 & 0 \\ 1 & 1 & 0 & 0 \end{array} \right) \sim \left( \begin{array}{ccc|c} 1 & 1 & 0 & 0 \\ 2 & -1 & 3 & 0 \\ 3 & 4 & -1 & 0 \end{array} \right) \xrightarrow{R_2 \leftrightarrow R_1} \left( \begin{array}{ccc|c} 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 \end{array} \right) \left. \begin{array}{l} 2 \text{ filas} \\ \text{iguais, ou seja,} \\ \text{múltiplas soluções} \end{array} \right\}$

$$\begin{array}{l|l} x+y=0 & 2x-y+3z=0 \\ x+\alpha=0 & -2\alpha-\alpha+3z=0 \\ x=-\alpha & -3\alpha+3z=0 \\ & 3z=3\alpha \\ & z=\alpha \end{array}$$

$$V = \{(-\alpha, \alpha, \alpha)\}$$

$$\boxed{15}$$

$$3- \begin{cases} x + y + z = 0 \\ kx + 3y + 4z = 0 \\ x + ky + 3z = 0 \end{cases}$$

$$k^2 - 7k + 10 = 0$$

$$\begin{array}{r|l} 10 & 5 \\ \hline 2 & \end{array}$$

$$2 + 5 = 7$$

$$2 \cdot 5 = 10$$

$$\rightarrow k' + k''$$

$$2 + 5 = 7$$

D

$$3 + 4k + 3k = 3 + 7k$$

$$\begin{array}{ccc|cc} 1 & 1 & 1 & 1 & 1 \\ k & 3 & 4 & k & 3 \end{array}$$

$$8 + k^2 - (3 + 7k)$$

$$\begin{array}{ccc|cc} 1 & k & 3 & 1 & k \end{array}$$

$$4 + 4 + k^2 = 8 + k^2$$

$$4- \begin{cases} x + 0 + k = 0 \\ kx + y + 0 = 0 \\ x + ky + 0 = 0 \end{cases} \rightarrow \begin{pmatrix} 1 & 0 & k & | & 0 \\ k & 1 & 0 & | & 0 \\ 1 & k & 0 & | & 0 \end{pmatrix} \sim \begin{pmatrix} 1 & 0 & k & | & 0 \\ 1 - k^2 & 0 & 0 & | & 0 \end{pmatrix}$$

$$X = 0 \rightarrow 1 - k^2 \neq 0$$

$$1 - k^2$$

$$1 \neq k^2$$

$$\pm 1 \neq k$$

$$k \neq 0$$

única

reduzida

$$V = \{k \in \mathbb{R} \mid k \neq 0, k \neq 1, k \neq -1\}$$

A

$$5- \begin{cases} -x + 2y - 3 = 0 \\ 3x - y + 3 = 0 \\ 2x - 4y + 6 = 0 \end{cases} \rightarrow \begin{pmatrix} -1 & 2 & | & 3 \\ 3 & -1 & | & -3 \\ 2 & -4 & | & 6 \end{pmatrix} \sim \begin{pmatrix} x & y \\ 0 & 5 & | & 6 \\ 0 & 0 & | & 0 \end{pmatrix} \rightarrow \begin{array}{l} 5y = 6 \\ y = \frac{6}{5} \end{array}$$

$$-x + 2 \cdot \frac{6}{5} = 3 \Rightarrow -x + \frac{12}{5} = 3 \Rightarrow -x = 3 - \frac{12}{5}$$

$$-x = 3 - \frac{12}{5}$$

$$\begin{array}{|c|c|} \hline x = -\frac{3}{5} & y = \frac{6}{5} \\ \hline \end{array}$$

são determinados

B