

Disciplina: **Noções de Geometria Analítica**
Professora: **Vanessa Soares Sandrini Garcia**

Aluno(a): Giago Belling

Data: 18/setembro/2015

6.3
6.1
9

1ª Avaliação

1. Considere as matrizes (vale 3,0):

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

1.0

Seja $X = A \cdot (B+C)$, calcule a inversa da matriz X .

2. Calcule os determinantes (vale 3,0):

a) $\begin{vmatrix} 3 & 1 & -2 \\ 1 & 0 & 0 \\ 2 & 1 & -2 \end{vmatrix}$

b) $\begin{vmatrix} 1 & 2 & 3 & 4 \\ 1 & 3 & 3 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & 2 & 0 \end{vmatrix}$

c) $\begin{vmatrix} 1 & 0 & 0 & 0 & 0 \\ 1 & 2 & 0 & 0 & 0 \\ 1 & 1 & 3 & 0 & 0 \\ 1 & 1 & 1 & 4 & 0 \\ 1 & 1 & 1 & 1 & 5 \end{vmatrix}$

1.8

3. Resolva o sistema abaixo (vale 1,5):

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

1.5

4. Calcule os valores x, y, a, b (vale 1,5): $\begin{bmatrix} a-3b & 2x+3y \\ 2a-b & x-y \end{bmatrix} = \begin{bmatrix} 5 & 2 \\ 6 & 1 \end{bmatrix}$

1.0

5. Calcule a matriz inversa de (vale 1,0):

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

1.0

Lucas Beling

1- $[B+C]$

$$\begin{bmatrix} 2 & 3 \\ 1 & -1 \end{bmatrix}_B + \begin{bmatrix} 2 & 1 \\ -1 & 3 \end{bmatrix}_C = \begin{bmatrix} 4 & 4 \\ 0 & 2 \end{bmatrix}_{B+C}$$

$A \cdot (B+C)$

$$\begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}_A \cdot \begin{bmatrix} 4 & 4 \\ 0 & 2 \end{bmatrix}_{(B+C)} = \begin{bmatrix} 1 \cdot 4 + 2 \cdot 0 & 1 \cdot 4 + 2 \cdot 2 \\ 0 \cdot 4 + 1 \cdot 0 & 0 \cdot 4 + 1 \cdot 2 \end{bmatrix}$$

$$X = \begin{bmatrix} 4 & 8 \\ \cancel{0} & \cancel{2} \end{bmatrix}$$

calcular a inversa

$$X \cdot X^{-1} = I \Rightarrow$$

$$\begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} a & b \\ c & d \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 4a+8c & 4b+8d \\ 8a+10c & 8b+10d \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$\begin{cases} 4a+8c=1 \\ 8a+10c=0 \end{cases}$$

$$\begin{cases} 4b+8d=0 \\ 8b+10d=1 \end{cases} \Rightarrow d = \frac{1}{2} \neq 0,5$$

$$a = \frac{1}{4}$$

$$c = 0$$

$$4b+8d=0$$

$$4b+8 \cdot (0,5) = 0$$

$$b = -1$$

Diogo Beling

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

$$\left| \begin{array}{ccc|c} 1 & 1 & 2 & -2 \\ 1 & 2 & -1 & 5 \\ 1 & -1 & -4 & 8 \\ 2 & 1 & 1 & 1 \end{array} \right| \begin{array}{l} l_1 + l_2 \\ l_2 + 2l_3 \\ \\ l_4 + l_3 \end{array}$$

$$\left| \begin{array}{ccc|c} 2 & 0 & -2 & 6 \\ 5 & 0 & -4 & 21 \\ 1 & -1 & -4 & 8 \\ 3 & 0 & -3 & 9 \end{array} \right| \begin{array}{l} \\ l_2 - l_4 \rightarrow \\ \\ \end{array} \left| \begin{array}{ccc|c} 2 & 0 & -2 & 6 \\ 0 & 0 & -6 & 12 \\ 1 & -1 & -4 & 8 \\ 3 & 0 & -3 & 9 \end{array} \right|$$

$$-6z = 12$$

$$z = \frac{-12}{-6}$$

$$z = -2$$

$$2x - 2z = 6$$

$$2x + 4 = 6$$

$$2x = 2$$

$$x = \frac{2}{2}$$

$$x = 1$$

$$x - y - 4 = 8$$

$$1 - y + 8 = 8$$

$$-y = 8 - 9$$

$$-y = -1 \cdot (-1)$$

$$y = 1$$

$$-x + y + 2z = -2$$

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

$$-2 = -2$$

$$-2 = -2$$

$$\begin{aligned} &= 1 \cdot (1) \cdot \begin{vmatrix} 1 & -2 \\ 1 & -2 \end{vmatrix} \\ &= (-1) \cdot 4 \cdot \begin{vmatrix} 1 & -2 \\ 1 & -2 \end{vmatrix} \\ &= (-4) \cdot (-2 + 2) + 2 + 2 + 2 + 2 \\ &= 4 \end{aligned}$$

dai zero

$$= 4 \cdot (-1) \cdot \begin{array}{ccc|cc} 1 & 3 & 3 & 1 & 3 \\ 0 & 1 & 1 & 0 & 1 \\ 0 & 1 & 2 & 0 & 1 \end{array}$$

$$\begin{aligned}
 &= 5 \cdot (-1) \cdot 24 \\
 &= (-5) \cdot 24 \\
 &= -120
 \end{aligned}$$

$$\begin{array}{ccc|ccc}
 1 & 0 & 0 & 0 & 1 & 0 \\
 1 & 2 & 0 & 0 & 1 & 2 \\
 1 & 1 & 3 & 0 & 1 & 1 \\
 1 & 1 & 1 & 4 & 1 & 1
 \end{array}$$

$$24 + 0 + 0$$

$$4) \begin{cases} a - 3b = 5 \times (-2) \\ 2a - b = 6 \end{cases}$$

$$-2a + 6b = -10$$

$$2a - b = 6$$

$$5b = -4$$

$$b = \frac{-4}{5}$$

$$a - 3b = 5$$

$$a - 3 \cdot \left(\frac{-4}{5} \right) = 5$$

$$a + \frac{12}{5} = 5$$

$$a = 5 - \frac{12}{5} = \frac{12}{5} = 2 + \frac{2}{5}$$

$$a = 3 + \frac{2}{5} = \frac{17}{5}$$

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

$$x - y = 1$$

$$x = 1 + y \rightarrow x = 1$$

$$2(1+y) + 3y = 2$$

$$2 + 2y + 3y = 2$$

$$5y = 0$$

$$y = 0$$

$$x = 1 \quad y = 0$$

$$a = \frac{17}{5}$$

$$b = \frac{4}{5}$$

$$5) \begin{bmatrix} a & b & c \\ -d & -e & -f \\ 2g & 2h & 2i \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad \begin{bmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & \frac{1}{2} \end{bmatrix}$$

$$a = 1$$

$$b = 0$$

$$c = 0$$

$$-d = 0 \rightarrow d = 0$$

$$-e = 1 \rightarrow e = -1$$

$$2g = 0 \rightarrow g = 0$$

$$-f = 0 \rightarrow f = 0$$

$$2h = 1$$

$$h = \frac{1}{2}$$