Tarefa Básica - matrizes

① $A = \begin{matrix} a_{11} & a_{12} \\ a_{21} & a_{21} \\ a_{31} & a_{31} \end{matrix}$

$a_{ij} = 2_i + 3_j$

$a_{11} = 2.1 + 3.1$
$= 2 + 3 = 5$

$a_{12} = 2.1 + 3.2$
$= 2 + 6 = 8$

$a_{21} = 2.2 + 3.1$
$= 4 + 3 = 7$

$a_{22} = 2.2 + 3.2$
$= 4 + 6 = 10$

$a_{31} = 2.3 + 3.1$
$= 6 + 3 = 9$

$a_{32} = 2.3 + 3.2$
$= 6 + 6 = 12$

$A = \begin{bmatrix} 5 & 8 \\ 7 & 10 \\ 9 & 12 \end{bmatrix}$

② $A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$

$a_{ij} = 1^2 + 2_i j^2$

$a_{11} = 1^2 + 4.1^2$
$= 1 + 4 = 5$

$a_{12} = 1^2 + 4.2^2$
$= 1 + 4.4$
$= 1 + 16 = 17$

$a_{21} = 2^2 + 4.1^2$
$= 4 + 4 = 8$

$a_{22} = 2^2 + 4.2^2$
$= 4 + 4.4$
$= 4.16 = 20$

$A = \begin{bmatrix} 5 & 17 \\ 8 & 20 \end{bmatrix}$

Ⓐ

③ $\begin{bmatrix} 1 & x+2 \\ y-1 & z+1 \end{bmatrix} = \begin{bmatrix} 1 & -x \\ 2y & -2z \end{bmatrix}$

$x = -1$
$y = -1$
$z = -1/3$

$y-1 = 2y$
$y = -1$

$x+2 = -x$
$2x = -2$
$x = -2/2 = -1$

$z+1 = -2z$
$3z = -1$
$z = -1/3$

④ $\begin{bmatrix} 3 & -x \\ 3x & x \end{bmatrix} = \begin{bmatrix} 3 & y \\ 2x+1 & 2\cdot1 \end{bmatrix}$ ⓐ

$3x = 2x+1$ $y = -x$ $x = 2-1$ $x = 1$
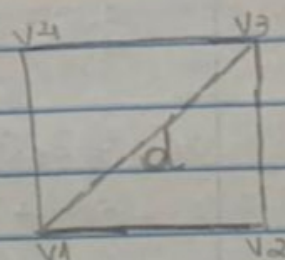$3x - 2x = 1$ $y = -1$ $1 = 2-1$ $y = -1$
$x = 1$ $2 = 2$ $z = 2$

⑤ $\begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} \\ a_{21} & a_{22} & a_{23} & a_{24} \\ a_{31} & a_{32} & a_{33} & a_{34} \\ a_{41} & a_{42} & a_{43} & a_{44} \end{bmatrix}$ $d^2 = a^2 + b^2$
$d^2 = 1^2 + 1^2$
$d^2 = 2$
$d = \sqrt{2}$

$a_{11} = v_1 - v_1 = 0$ $a_{12} = v_1 - v_2 = 1$ $a_{13} = v_1 - v_3 = d = \sqrt{2}$ $a_{14} = v_1 - v_4 = 1$
$a_{21} = v_2 - v_1 = 1$ $a_{22} = v_2 - v_2 = 0$ $a_{23} = v_2 - v_3 = 1$ $a_{24} = v_2 - v_4 = d = \sqrt{2}$
$a_{31} = v_3 - v_1 = d = \sqrt{2}$ $a_{32} = v_3 - v_2 = 1$ $a_{33} = v_3 - v_3 = 0$ $a_{34} = v_3 - v_4 = 1$
$a_{41} = v_4 - v_1 = 1$ $a_{42} = v_4 - v_2 = d = \sqrt{2}$ $a_{43} = v_4 - v_3 = 1$ $a_{44} = v_4 - v_4 = 0$

$\begin{bmatrix} 0 & 1 & \sqrt{2} & 1 \\ 1 & 0 & 1 & \sqrt{2} \\ \sqrt{2} & 1 & 0 & 1 \\ 1 & \sqrt{2} & 1 & 0 \end{bmatrix}$ ⓑ

⑥ $A = \begin{bmatrix} -1 \\ 2 \\ 3 \end{bmatrix}$ $B = \begin{bmatrix} 0 \\ -2 \\ 1 \end{bmatrix}$ $2A - B$

$2A = \begin{bmatrix} -2 \\ 4 \\ 6 \end{bmatrix}$ $2A - (B) = \begin{bmatrix} -2 \\ 4 \\ 5 \end{bmatrix}$ ⓒ

⑦ $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$ $B = \begin{bmatrix} -1 & 3 & 2 \\ 2 & 0 & 1 \end{bmatrix}$ $A - B^t$

$B^t = \begin{bmatrix} -1 & 2 \\ 3 & 0 \\ 2 & 1 \end{bmatrix}$ $A - (B)^t = \begin{bmatrix} 2 & 0 \\ 0 & 4 \\ 3 & 5 \end{bmatrix}$ (B)

⑧ $A = \begin{bmatrix} 2 & -1 & 2y \\ x & 0 & -2 \\ 4 & 3 & 2 \end{bmatrix} = A^t : \begin{bmatrix} 2 & x & 4 \\ -1 & 0 & 3 \\ 2y & -2 & 2 \end{bmatrix}$

$x = -1$ $-2 = 3$ $2y = 4$ $\left\{ \begin{array}{l} x + y + 2 \\ (-1) + 2 + (-3) \\ -1 + 2 \\ -2 \end{array} \right.$ (A)

$2 = -3$ $y = 4/2$
                $y = 2$

⑨ $A = (a_{ij}) = 3 \times 2$ $B = (b_{ij}) = 3 \times 2$

se $i \neq j$, $a_{ij} = i + j$ $\begin{array}{cc} a_{11} & a_{12} \\ a_{21} & a_{22} \\ a_{31} & a_{32} \end{array}$ se $i \neq j$, $b_{ij} = 0$ $\begin{array}{cc} b_{11} & b_{12} \\ b_{21} & b_{22} \\ b_{31} & b_{32} \end{array}$

se $i = j$, $a_{ij} = 1$

$a_{11} = 1$ $a_{12} = 1+2 = 3$ $A = \begin{bmatrix} 1 & 3 \\ 3 & 1 \\ 4 & 5 \end{bmatrix}$ $b_{11} = 2 \cdot 1 - 1 = 1$ $b_{12} = 0$ $B = \begin{bmatrix} 1 & 0 \\ 0 & 2 \\ 0 & 0 \end{bmatrix}$

$a_{21} = 2+1 = 3$ $a_{22} = 1$ $b_{21} = 0$ $b_{22} = 2 \cdot 2 - 2 = 2$

$a_{31} = 3+1 = 4$ $a_{32} = 3+2 = 5$ $b_{31} = 0$ $b_{32} = 0$

$A + B = \begin{bmatrix} 2 & 3 \\ 3 & 3 \\ 4 & 5 \end{bmatrix}$ (C)

(10) $\dfrac{3}{2}m + \dfrac{2}{3}N = P$ $\qquad\qquad y = x = ?$

$\dfrac{3}{2}M = \begin{bmatrix} \frac{3x}{2} & 12 \\ 15 & \frac{3y}{2} \end{bmatrix} + \dfrac{2}{3}N = \begin{bmatrix} \frac{2y}{3} & 4 \\ 8 & \frac{2x+8}{3} \end{bmatrix} = P = \begin{bmatrix} 7 & 16 \\ 23 & 13 \end{bmatrix}$

$3x/2 + 2y/3 = 7$ $\qquad\qquad\qquad 3y/2 + (2x+8)/3 = 13$

$(9x+4y)/6 = 42/6$ $\qquad\qquad (9y+4x+16)/6 = 78/6$

$9x + 4y = 42$ $\qquad\qquad\qquad 9y + 4x + 16 = 78$

$-9x - 4y + 9y + 4x = 78 - 42 - 16$

$-5x + 5y = 20$

$5(y - x) = 20$ $\qquad\qquad$ (B)

$y - x = 20/5$

$y - x = 4$