ANO 2011	DISCIPLINA: Matemática		PROFESSOR(A): Adriano Lima		SERIE/TURMA: 3º Ano	VALOR:
	ATIVIDADE ☐	TRABALHO ■	PROVA PARCIAL ☐	PROVA FINAL ☐	RECUPERAÇÃO ☐	
	ETAPA: 1ª Etapa		SUPERVISORA: Lânia Rezende		DATA:	NOTA OBTIDA:
ALUNO(A):					N.º	

Lista de Exercícios IV - 3º Ano
Matriz e Determinante
24 de abril de 2011

1. Calcule o determinante das seguintes matrizes:

(a) $A = \begin{bmatrix} 5 \end{bmatrix}$

(b) $B = \begin{bmatrix} \pi \end{bmatrix}$

(c) $C = \begin{bmatrix} 2 & 4 \\ 5 & 7 \end{bmatrix}$

(d) $D = \begin{bmatrix} \frac{1}{2} & \sqrt{8} \\ 1 & \sqrt{2} \end{bmatrix}$

(e) $E = \begin{bmatrix} 1 & 2 \\ 4 & 9 \end{bmatrix}$

(f) $F = \begin{bmatrix} \sqrt{2}+1 & \sqrt{3} \\ \sqrt{3} & \sqrt{2}-1 \end{bmatrix}$

(g) $G = \begin{bmatrix} 8 \end{bmatrix}$

(h) $H = \begin{bmatrix} 2 \end{bmatrix}$

(i) $I = \begin{pmatrix} -3 \end{pmatrix}$

(j) $J = \begin{pmatrix} 3 & -4 \\ 1 & 2 \end{pmatrix}$

(k) $K = \begin{pmatrix} 1 & 2 \\ 4 & 3 \end{pmatrix}$

(l) $L = \begin{pmatrix} 4 & -3 \\ 1 & 4 \end{pmatrix}$

(m) $M = \begin{pmatrix} 2 & -3 \\ 1 & 5 \end{pmatrix}$

(n) $N = \begin{pmatrix} \frac{2}{3} & 1 \\ 0 & 3 \end{pmatrix}$

(o) $O = \begin{pmatrix} 5 \end{pmatrix}$

2. Ache o valor dos determinantes das matrizes de 2ª ordem abaixo:

(a) $\begin{vmatrix} -5 & 2 \\ 3 & -1 \end{vmatrix}$

(b) $\begin{vmatrix} 6 & -4 \\ 2 & 3 \end{vmatrix}$

(c) $\begin{vmatrix} 1+\sqrt{5} & -1 \\ 2 & 1-\sqrt{5} \end{vmatrix}$

(d) $\begin{vmatrix} -5 & 1 \\ 2 & 4 \end{vmatrix}$

(e) $\begin{vmatrix} \sqrt{2} & 2\sqrt{3} \\ \sqrt{6} & 5 \end{vmatrix}$

(f) $\begin{vmatrix} -2 & -4 \\ 3 & 2 \end{vmatrix} - \begin{vmatrix} 1 & -2 \\ 3 & \frac{1}{2} \end{vmatrix}$

(g) $\begin{vmatrix} 6 & 2 \\ 4 & 3 \end{vmatrix}$

(h) $\begin{vmatrix} -3 & -8 \\ 1 & 2 \end{vmatrix}$

(i) $\begin{vmatrix} 6 & 10 \\ 3 & 5 \end{vmatrix}$

(j) $\begin{vmatrix} 1+\sqrt{5} & 3 \\ 4 & 1-\sqrt{5} \end{vmatrix}$

3. Calcule os determinantes das matrizes de ordem 3, aplicando a *regra de Sarrus*:

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

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

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

(d) $\begin{vmatrix} 5 & 0 & -1 \\ 2 & 3 & 4 \\ 1 & 2 & 3 \end{vmatrix}$

(e) $\begin{vmatrix} 1 & 2 & 0 \\ 2 & 4 & 1 \\ -3 & -6 & 0 \end{vmatrix}$

(f) $\begin{vmatrix} 2 & -3 & 4 \\ 5 & 6 & 8 \\ 1 & 3 & 7 \end{vmatrix}$

(g) $\begin{vmatrix} 2 & 3 & -5 \\ 1 & 2 & 0 \\ 4 & -1 & 6 \end{vmatrix}$

(h) $\begin{vmatrix} 3 & 1 & 2 \\ 4 & -3 & 1 \\ -1 & 6 & 5 \end{vmatrix}$

(i) $\begin{vmatrix} 1 & 9 & 6 \\ -8 & 4 & 7 \\ 0 & 0 & 1 \end{vmatrix}$

(j) $\begin{vmatrix} 3 & 2 & 5 \\ 4 & 1 & 3 \\ 2 & 3 & 4 \end{vmatrix}$

(k) $\begin{vmatrix} 0 & 3 & 0 \\ -2 & 3 & 1 \\ 4 & -2 & 5 \end{vmatrix}$

(l) $\begin{vmatrix} 2 & 2 & 0 \\ 1 & 1 & 1 \\ 1 & 3 & 0 \end{vmatrix}$

(m) $\begin{vmatrix} 0 & 5 & 3 \\ 0 & 4 & -2 \\ 0 & 1 & 6 \end{vmatrix}$

(n) $\begin{vmatrix} 3 & 2 & -1 \\ 5 & 0 & 4 \\ 2 & -3 & 1 \end{vmatrix}$

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

(p) $\begin{vmatrix} 3 & 5 & -1 \\ 0 & 4 & 2 \\ 0 & 0 & -2 \end{vmatrix}$

(q) $\begin{vmatrix} 3 & 0 & 8 \\ 0 & 7 & 7 \\ 4 & 9 & 0 \end{vmatrix}$

(r) $\begin{vmatrix} 0 & 0 & 5 \\ 8 & 10 & 3 \\ 0 & 7 & 4 \end{vmatrix}$

(s) $\begin{vmatrix} 1 & -1 & 1 \\ -1 & 1 & 1 \\ 1 & 1 & -1 \end{vmatrix}$

(t) $\begin{vmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \end{vmatrix}$

(u) $\begin{vmatrix} 1 & -1 & -1 \\ -1 & -1 & 1 \\ -1 & 1 & -1 \end{vmatrix}$

(v) $\begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix}$

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

(x) $\begin{vmatrix} 5 & -2 & 3 \\ 1 & 6 & 8 \\ 2 & 7 & 9 \end{vmatrix}$

(y) $\begin{vmatrix} 0,25 & \frac{1}{8} & 1 \\ 3 & -\frac{1}{6} & 0,75 \\ -1 & -\frac{1}{2} & -4 \end{vmatrix}$

4. Determine o conjunto solução das seguintes equações:

(a) $\begin{vmatrix} 3 & x \\ 2 & 4 \end{vmatrix} = 0$

(b) $\begin{vmatrix} -1 & 3 \\ x & 9 \end{vmatrix} = 0$

(c) $\begin{vmatrix} 2x & -4 \\ 8 & 3 \end{vmatrix} = 38$

(d) $\begin{vmatrix} x+1 & 3 \\ 1 & 2 \end{vmatrix} = 7$

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

(f) $\begin{vmatrix} x & x+2 \\ 5 & 7 \end{vmatrix} = 0$

(g) $\begin{vmatrix} x & x \\ 5 & x \end{vmatrix} = 0$

(h) $\begin{vmatrix} x+3 & 5 \\ 1 & x-1 \end{vmatrix} = 0$

(i) $\begin{vmatrix} \frac{x-1}{3} & \frac{1}{9} \\ 18 & \frac{x+1}{2} \end{vmatrix} = 0$

(j) $\begin{vmatrix} x-2 & 6 \\ 3 & 5 \end{vmatrix} = 2$

(k) $\begin{vmatrix} x+3 & 5 \\ 1 & x-1 \end{vmatrix} = 0$

(l) $\dfrac{\begin{vmatrix} 1 & x \\ 1 & 1 \end{vmatrix}}{\begin{vmatrix} 1 & 1 \\ x & 1 \end{vmatrix}} = \begin{vmatrix} 1 & 1 \\ x & 1 \end{vmatrix}$

5. Sabendo-se que $a = \begin{vmatrix} -3 & 2 \\ -5 & 1 \end{vmatrix}$ e $b = \begin{vmatrix} 2 & 6 \\ 4 & 10 \end{vmatrix}$, calcule o valor de $3a + b^2$.

6. Sabendo que $a = \begin{vmatrix} 3 & -2 \\ 1 & -1 \end{vmatrix}$, $b = \begin{vmatrix} -1 & 3 \\ 2 & 0 \end{vmatrix}$ e $c = \begin{vmatrix} -2 & 4 \\ 4 & -7 \end{vmatrix}$, calcule o número real x tal que $x = 3a - 2b + c^2$.

7. Determine o conjunto solução das equações, aplicando a *regra de Sarrus*:

(a) $\begin{vmatrix} 1 & x & 1 \\ -2 & -4 & 2 \\ 4 & 8 & 3 \end{vmatrix} = 0$

(b) $\begin{vmatrix} -3 & 4 & x \\ 5 & 0 & 0 \\ 2 & 1 & 2 \end{vmatrix} = 0$

(c) $\begin{vmatrix} -2 & 1 & x \\ 1 & 2 & 4 \\ 3 & -1 & -2 \end{vmatrix} = -7$

(d) $\begin{vmatrix} 2x & -3 & 0 \\ 0 & 1 & -2 \\ 3 & -1 & 4 \end{vmatrix} = 26$

(e) $\begin{vmatrix} 1 & 1 & 3 \\ x & x & 4 \\ 0 & x & 2 \end{vmatrix} = \begin{vmatrix} 2x & 4 \\ 1 & x \end{vmatrix}$

(f) $\begin{vmatrix} 2 & 2 & 2 \\ 2 & x & 2 \\ 2 & 2 & x \end{vmatrix} = 0$

(g) $\begin{vmatrix} 2 & 4 & 1 \\ 2 & 4 & x \\ 3 & 1 & 2 \end{vmatrix} = 0$

(h) $\begin{vmatrix} 2 & 3 & -2 \\ 0 & 1 & x \\ 2 & x & -3 \end{vmatrix} = 2$

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

(j) $\begin{vmatrix} 2 & 1 & 3 \\ 4 & -1 & x-1 \\ x & 0 & x \end{vmatrix} = 12$

8. Dê os números reais x e y tais que $\begin{vmatrix} 0 & 0 & 1 \\ 2 & x & 4 \\ 1 & 1 & y \end{vmatrix} = 1$ e $\begin{vmatrix} 1 & x & 0 \\ 0 & y & 1 \\ 1 & 0 & 1 \end{vmatrix} = 8$.

9. Calcule x e y, de sorte que $\begin{vmatrix} 1 & 0 & 1 \\ 2 & 4 & 3 \\ x & y & 5 \end{vmatrix} = 6$ e $\begin{vmatrix} 3 & 1 & x \\ 2 & y & 1 \\ 0 & 3 & 5 \end{vmatrix} = 29$.

10. Encontre a solução da equação $\begin{vmatrix} 2x & 9 \\ 2 & x \end{vmatrix} = \begin{vmatrix} 1 & 2 & 3-x \\ 2 & 3 & 1 \\ 3 & 1 & 2+x \end{vmatrix}$.

GABARITO

1. (a) $det\ A = 5$
   (b) $det\ B = \pi$
   (c) $det\ C = -6$
   (d) $det\ D = \frac{-3\sqrt{2}}{2}$
   (e) $det\ E = 1$
   (f) $det\ F = -2$
   (g) $det\ G = 8$
   (h) $det\ H = 2$
   (i) $det\ I = -3$
   (j) $det\ J = 10$
   (k) $det\ K = -5$
   (l) $det\ L = 19$
   (m) $det\ M = 13$
   (n) $det\ N = 2$
   (o) $det\ O = 5$
2. (a) -1
   (b) 26
   (c) -2
   (d) -22
   (e) $-\sqrt{2}$
   (f) $\frac{3}{2}$
   (g) 10
   (h) 2
   (i) 0
   (j) -16
3. (a) -4
   (b) 20
   (c) 78
   (d) 4
   (e) 0
   (f) 153
   (g) 51
   (h) -42
   (i) 76
   (j) 15
   (k) 42
   (l) 2
   (m) 0
   (n) 57
   (o) 1
   (p) -24
   (q) -413
   (r) 280
   (s) -4
   (t) 2
   (u) 4
   (v) 0
   (w) 131
   (x) -39
   (y) 0
4. (a) $S = \{6\}$
   (b) $S = \{-3\}$
   (c) $S = \{1\}$
   (d) $S = \{4\}$
   (e) $S = \left\{-\frac{3}{8}\right\}$
   (f) $S = \{5\}$
   (g) $S = \{0,\ 5\}$
   (h) $S = \{-4,\ 2\}$
   (i) $S = \{-\sqrt{13},\ \sqrt{13}\}$
   (j) $S = \{6\}$
   (k) $S = \{-4,\ 2\}$
   (l) $S = \{0\}$
5. 37
6. $x = 13$
7. (a) $S = \{2\}$
   (b) $S = \{8\}$
   (c) $S = \{3\}$
   (d) $S = \{2\}$
   (e) $S = \{2\}$
   (f) $S = \{2\}$
   (g) $S = \{1\}$
   (h) $S = \{1,\ 2\}$
   (i) $S = \left\{\frac{7}{3}\right\}$
   (j) $S = \{-2,\ 6\}$
8. $x = 1$ e $y = 7$
9. $x = 3$ e $y = 2$
10. $S = \{(0,\ 3)\}$