

SEÇÃO 5

1. (a) $\begin{pmatrix} 3 & -\frac{5}{2} \\ -\frac{5}{2} & 1 \end{pmatrix}$; (b) $\begin{pmatrix} 2 & \frac{1}{2} & -1 \\ \frac{1}{2} & 3 & \frac{3}{2} \\ -1 & \frac{3}{2} & 1 \end{pmatrix}$

3. (a) $Q = \frac{1}{\sqrt{2}} \begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}, \frac{(x')^2}{4} + \frac{(y')^2}{12} = 1$, elipse;

(d) $Q = \frac{1}{\sqrt{2}} \begin{pmatrix} 1 & 1 \\ -1 & 1 \end{pmatrix}, \left(y' + \frac{\sqrt{2}}{2}\right)^2 =$
 $= -\frac{\sqrt{2}}{2}(x' - \sqrt{2})$ ou $(y'')^2 = -\frac{\sqrt{2}}{2}x''$, parábola

6. (a) Positiva definida; (b) indefinida; (d) negativa definida; (e) indefinida.

7. (a) Mínimo; (b) ponto de sela; (c) ponto de sela; (f) máximo local.

SEÇÃO 6

1. (a) $\det(A_1) = 2, \det(A_2) = 3$, positiva definida;
 (b) $\det(A_1) = 3, \det(A_2) = -10$, não é positiva definida;
 (c) $\det(A_1) = 6, \det(A_2) = 14, \det(A_3) = -38$, não é positiva definida;
 (d) $\det(A_1) = 4, \det(A_2) = 8, \det(A_3) = 13$, positiva definida;

2. $a_{11} = 3, a_{22}^{(1)} = 2, a_{33}^{(2)} = \frac{4}{3}$

3. (a) $\begin{pmatrix} 1 & 0 \\ \frac{1}{2} & 1 \end{pmatrix} \begin{pmatrix} 4 & 0 \\ 0 & 9 \end{pmatrix} \begin{pmatrix} 1 & \frac{1}{2} \\ 0 & 1 \end{pmatrix}$;

(b) $\begin{pmatrix} 1 & 0 \\ -\frac{1}{3} & 1 \end{pmatrix} \begin{pmatrix} 9 & 0 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & -\frac{1}{3} \\ 0 & 1 \end{pmatrix}$;

(c) $\begin{pmatrix} 1 & 0 & 0 \\ \frac{1}{2} & 1 & 0 \\ \frac{1}{4} & -1 & 1 \end{pmatrix} \begin{pmatrix} 16 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 4 \end{pmatrix} \begin{pmatrix} 1 & \frac{1}{2} & \frac{1}{4} \\ 0 & 1 & -1 \\ 0 & 0 & 1 \end{pmatrix}$;

(d) $\begin{pmatrix} 1 & 0 & 0 \\ \frac{1}{3} & 1 & 0 \\ -\frac{2}{3} & 1 & 1 \end{pmatrix} \begin{pmatrix} 9 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 2 \end{pmatrix} \begin{pmatrix} 1 & \frac{1}{3} & -\frac{2}{3} \\ 0 & 1 & 1 \\ 0 & 0 & 1 \end{pmatrix}$

4. (a) $\begin{pmatrix} 2 & 0 \\ 1 & 3 \end{pmatrix} \begin{pmatrix} 2 & 1 \\ 0 & 3 \end{pmatrix}$; (b) $\begin{pmatrix} 3 & 0 \\ -1 & 1 \end{pmatrix} \begin{pmatrix} 3 & -1 \\ 0 & 1 \end{pmatrix}$;

(c) $\begin{pmatrix} 4 & 0 & 0 \\ 2 & \sqrt{2} & 0 \\ 1 & -\sqrt{2} & 2 \end{pmatrix} \begin{pmatrix} 4 & 2 & 1 \\ 0 & \sqrt{2} & -\sqrt{2} \\ 0 & 0 & 2 \end{pmatrix}$;

(d) $\begin{pmatrix} 3 & 0 & 0 \\ 1 & \sqrt{3} & 0 \\ -2 & \sqrt{3} & \sqrt{2} \end{pmatrix} \begin{pmatrix} 3 & 1 & -2 \\ 0 & \sqrt{3} & \sqrt{3} \\ 0 & 0 & \sqrt{2} \end{pmatrix}$