Oficina WXMaxima

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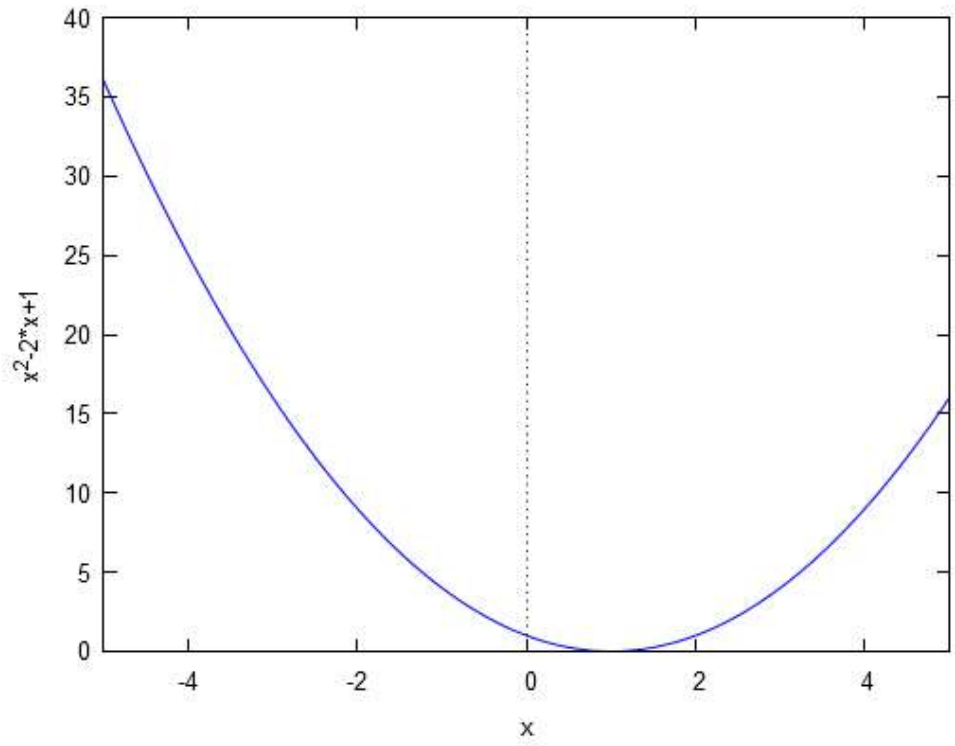
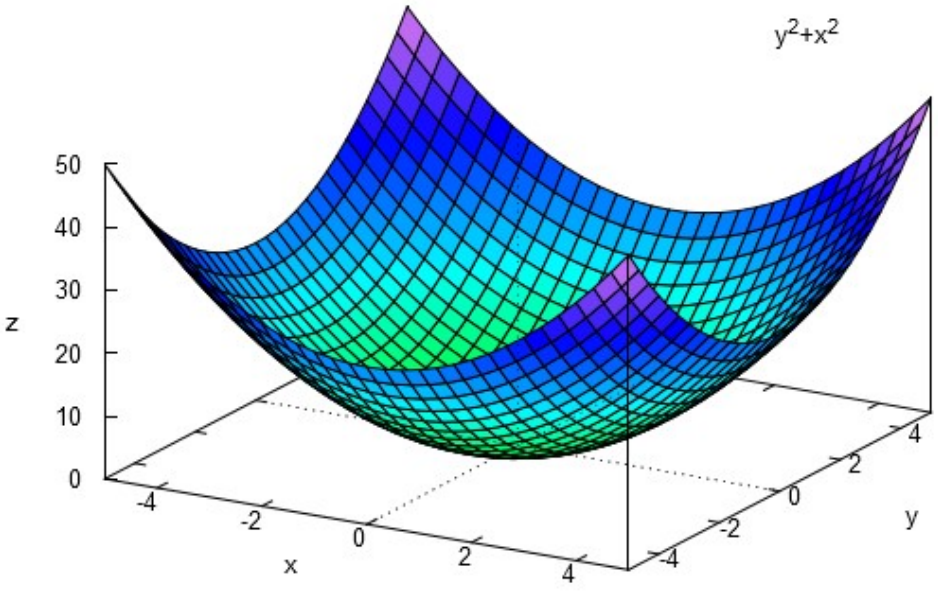
1° Matrizes, determinantes, funções, polinômios, gráficos entre outros.

2°

1) $f(x) = y = x^2 - 2x + 1$



2) $z = f(x, y) = x^2 + y^2$



3)

```
limit((x^2-9)/x-3, x, 3);
-3
```

z

```
-->     diff(x^3-3*x+4,x,1);
(%o2)   3 x^2 -3
```

4)

5)

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-->     integrate(2*x-e^x, x);
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$$(\%o3) \quad x^2 - \frac{e^x}{\log(e)}$$

6)

7)

$$\begin{bmatrix} 2 & -1 & 0 \\ 3 & 2 & 1 \\ 2 & -1 & 3 \end{bmatrix}$$

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determinant(%);
21
```

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invert(matrix([2,-1,0],[3,2,1],[2,-1,3]));
```

$$\begin{bmatrix} \frac{1}{3} & \frac{1}{7} & -\frac{1}{21} \\ -\frac{1}{3} & \frac{2}{7} & -\frac{2}{21} \\ -\frac{1}{3} & 0 & \frac{1}{3} \end{bmatrix}$$

8) Autovalores:

(%o15)
$$\left[\left[-\frac{11\left(\frac{\sqrt{3}\,\%i}{2}-\frac{1}{2}\right)}{9\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}}+\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}\left(-\frac{\sqrt{3}\,\%i}{2}-\frac{1}{2}\right)+\frac{7}{3},\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}\left(\frac{\sqrt{3}\,\%i}{2}-\frac{1}{2}\right)-\frac{11\left(-\frac{\sqrt{3}\,\%i}{2}-\frac{1}{2}\right)}{9\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}}+\frac{7}{3},\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}-\frac{11}{9\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}}+\frac{7}{3}\right],[1,1,1]\right]$$

- **Autovetores:**

(%o16)
$$\left[\left[\left[-\frac{11\left(\frac{\sqrt{3}\,\%i}{2}-\frac{1}{2}\right)}{9\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}}+\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}\left(-\frac{\sqrt{3}\,\%i}{2}-\frac{1}{2}\right)+\frac{7}{3},\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}\left(\frac{\sqrt{3}\,\%i}{2}-\frac{1}{2}\right)-\frac{11\left(-\frac{\sqrt{3}\,\%i}{2}-\frac{1}{2}\right)}{9\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}}+\frac{7}{3},\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}-\frac{11}{9\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}}+\frac{7}{3}\right],[1,1,1]\right],\left[\left[1,\frac{\left(3^{5/2}\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{2/3}+11\sqrt{3}\right)\%i+9\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{2/3}-6\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}-11}{18\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}},\right.\right.\right.$$

$$\left.\left.\left.\frac{\left(\left(3\,2^{4/3}\sqrt{199}-19\,2^{7/3}\sqrt{3}\right)\left(3^{3/2}\sqrt{199}-7\right)^{2/3}+\left(33\,2^{2/3}\sqrt{199}+187\,2^{2/3}\sqrt{3}\right)\left(3^{3/2}\sqrt{199}-7\right)^{1/3}\right)\%i+\left(19\,2^{7/3}-2^{4/3}\sqrt{3}\sqrt{199}\right)\left(3^{3/2}\sqrt{199}-7\right)^{2/3}+\left(11\,2^{2/3}\sqrt{3}\sqrt{199}+187\,2^{2/3}\right)\left(3^{3/2}\sqrt{199}-7\right)^{1/3}-1936}{2904}\right]\right],\left[\left[1,-\frac{\left(3^{5/2}\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{2/3}+11\sqrt{3}\right)\%i-9\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{2/3}+6\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}+11}{18\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}},\right.\right.\right.$$

$$\left.\left.\left.-\frac{\left(\left(3\,2^{4/3}\sqrt{199}-19\,2^{7/3}\sqrt{3}\right)\left(3^{3/2}\sqrt{199}-7\right)^{2/3}+\left(33\,2^{2/3}\sqrt{199}+187\,2^{2/3}\sqrt{3}\right)\left(3^{3/2}\sqrt{199}-7\right)^{1/3}\right)\%i+\left(2^{4/3}\sqrt{3}\sqrt{199}-19\,2^{7/3}\right)\left(3^{3/2}\sqrt{199}-7\right)^{2/3}+\left(-11\,2^{2/3}\sqrt{3}\sqrt{199}-187\,2^{2/3}\right)\left(3^{3/2}\sqrt{199}-7\right)^{1/3}+1936}{2904}\right]\right],\left[\left[1,-\frac{9\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{2/3}+3\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}-11}{9\left(\frac{\sqrt{199}}{2\,3^{3/2}}-\frac{7}{54}\right)^{1/3}},\right.\right.\right.$$

$$\left.\left.\left.\frac{\left(2^{4/3}\sqrt{3}\sqrt{199}-19\,2^{7/3}\right)\left(3^{3/2}\sqrt{199}-7\right)^{2/3}+\left(-11\,2^{2/3}\sqrt{3}\sqrt{199}-187\,2^{2/3}\right)\left(3^{3/2}\sqrt{199}-7\right)^{1/3}-968}{1452}\right]\right]\right]$$