Práctica final

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1.

$$\int_0^x e^{-t^2} dt = \int_0^x \sum_{n=0}^{\infty} \frac{(-1)^n t^{2n}}{n!} dt = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{n!(2n+1)} = 0{,}5$$

2.

$$(x_k - c_1)^2 + (y_k - c_2)^2 = r^2 \quad (-2x_k c_1) + (-2y_k c_2) + (c_1^2 - c_2^2 - r^2) = -x_k^2 - y_k 2$$

$$\lambda = -2c_1 \quad \phi = -2c_2 \quad \gamma = c_1^2 - c_2^2 - r^2$$

$$\begin{pmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ \vdots & \vdots & \vdots \\ x_8 & y_8 & 1 \end{pmatrix} \begin{pmatrix} \lambda \\ \mu \\ \gamma \end{pmatrix} = \begin{pmatrix} x_1^2 - y_1^2 \\ x_2^2 - y_2^2 \\ \vdots \\ x_8^2 - y_8^2 \end{pmatrix}$$

$$c_1 = \frac{-\Lambda}{2} \quad c_2 = \frac{-\Phi}{2} \quad r = \sqrt{c_1^2 - c_2^2 - \Gamma}$$

3.

$$f(x_1, x_2) = (x_1^2 + 4x_2^2 - 5, 2x_1^2 - 2x_1 - 3x_2 - 2{,}5)$$

$$J = \begin{pmatrix} 2x_1 & 8x_2 \\ 4x_1 - 2 & -3 \end{pmatrix}$$