

Math Problems

1. Solve the equation

$$x = \cos(x) \quad (\text{fzero})$$

2. Evaluate

$$\int_0^1 \exp(-x^2) dx \quad (\text{quad})$$

3. Find a cubic spline through the data

x	y
0	0
1	1
2	0
3	5

and sketch it on the interval [0,5].

(spline)

4. Find

$$\underset{x>0}{\text{Max}} x^2 e^{-x} \quad (\text{fminbnd})$$

5. Find

$$\underset{(x,y)}{\text{Min}} (x^2 - 1)^2 + (y - e^x)^2 \quad (\text{fminsearch})$$

6. Solve the ODE

$$\frac{dx}{dt} = -x; \quad x(0) = 1. \quad (\text{ode45})$$

7. Solve the system of ODEs

$$\begin{aligned} \frac{dx}{dt} &= x - 2xy \\ \frac{dy}{dt} &= -3y + 2xy \end{aligned} \quad (\text{ode45})$$
$$(x(0), y(0)) = (.05, .05)$$