Introduction to Week Three

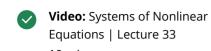
Gaussian Elimination

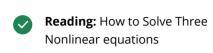
Operation Counts

Eigenvalues and Eigenvectors

Matrix Algebra in MATLAB

Systems of Nonlinear Equations





Video: Systems of Nonlinear Equations (Example) | Lecture 34 9 min

Ungraded External Tool: Fixed-Point Solutions of the Lorenz Equations

10 min

Quiz

Programming Assignment: Fractals from the Lorenz Equations

How to Solve Three Nonlinear equations

The algorithm for solving the system of two equations and two unknowns,

$$f(x,y) = 0, \qquad g(x,y) = 0,$$

is given by the following two-step process.

1. Solve the linear system for Δx_n and Δy_n given by

$$egin{pmatrix} f_x & f_y \ g_x & g_y \end{pmatrix} egin{pmatrix} \Delta x_n \ \Delta y_n \end{pmatrix} = egin{pmatrix} -f \ -g \end{pmatrix}.$$

2. Advance the iterative solution, using

$$x_{n+1} = x_n + \Delta x_n, \qquad y_{n+1} = y_n + \Delta y_n.$$

Write down the corresponding algorithm for three equations and three unknowns.

✓ Completed Go to next item

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