

Introduction to Week Six

Numerical Solutions of PDEs

Direct Solution of Boundary Value Problems

✔ **Video:** Discrete Laplace Equation | Lecture 62
9 min

✔ **Reading:** Mean Value Property of the Laplace Equation
10 min

✔ **Video:** Natural Ordering | Lecture 63
8 min

✔ **Reading:** Coordinates of the four corners
5 min

✔ **Video:** Matrix Formulation | Lecture 64
12 min

✔ **Reading:** The Discrete Laplace Equation on a Four-by-Four Grid
10 min

📖 **Reading:** Number of Interior and Boundary Points
10 min

▶ **Video:** MATLAB Solution of the Laplace Equation (Direct Method) | Lecture 65
17 min

🔗 **Ungraded External Tool:** Direct Solution of the Laplace Equation
30 min

Iterative Solution of Boundary Value Problems

Time-stepping Methods for Initial Value Problems

Quiz

Programming Assignment: Two-dimensional Diffusion Equation

Farewell

The Discrete Laplace Equation on a Four-by-Four Grid

Construct the matrix equation for the discrete Laplace equation on a four-by-four grid. When k indexes a boundary point, assume that $\Phi_k = b_k$ is known.

✔ **Completed** **Go to next item**

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