

MATH-332: Linear Algebra

Chapter: 6

Orthogonality and Least SquaresSection 6.5: Least-Squares Problems

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Lecture: Least-Squares Problems**Topics:**

General Least-squares problem

Normal Equations

Alternative Least Squares

**Problems**

Prac: 1, 2

Prob: 3, 5, 7, 9, 11, 15, 17, 18, 19, 21

**Section Goals**

- Understand how projections can be used to find approximate solutions to inconsistent systems of equations.

**Section Objectives**

- Formulate the general least-squares problem and its associated error.
- Using the best-approximation theorem and the orthogonal-decomposition theorem derive the system of normal equations associated with the general least squares problem.
- Present an example of a least-squares problem for a set of planes in  $\mathbb{R}^3$ .