

Math 464 Midterm Exam Skills List

The following list of skills is my expectation for you to succeed on the midterm exam.

- Recognize a well-composed and notationally correct optimization problem.
- Recognize a Linear Program and a standard form Linear Program.
- Transform any Linear Program into a standard form Linear Program.
- Be able to model example decision-making situations as Linear Programs.
- Understand the geometry of Linear Programs including the nature of the feasible region, the objective function, and characteristics of the set of optimal solutions.
- Understand and use the definition of a polyhedron to recognize polyhedra and prove geometric relationships.
- Understand the geometry of polyhedra including the defining characteristics of extreme points, vertices, basic solutions, basic feasible solutions, feasible points, degeneracy.
- Prove various concepts and results which relate the above geometric characteristics of polyhedra.
- Be able to prove or disprove whether functions $f : \mathbb{R}^n \rightarrow \mathbb{R}$ or subsets of \mathbb{R}^n are convex. Understand and use the idea of convex hull.
- Understand and explain the Simplex Method from an algorithmic viewpoint: well-defined steps, finite, convergent.
- Be able to solve (computationally) a given Linear Program using a tableau simplex method.
- Be able to solve (computationally) a given Linear Program using a basic solution enumeration method.
- Be able to comment on the usefulness and/or importance of any Theorem or Corollary from the text.

These skills are fairly well represented in the following Sections and Exercises from the text: Chapter 1 Sections 1-5; Chapter 2 Exercises 1-4,7-14,16; Chapter 3 Exercises 1-5,12,15(concept),17-20,22. Also, review all of our quizzes.