

Problem Solving and Reasoning with Discrete Mathematics

Features

Problem Solving and Reasoning with Discrete Mathematics is a mathematics textbook. Its content focus is those topics known collectively as “discrete mathematics,” but its actual focus is problem solving, mathematical modeling, and reasoning – aspects of mathematics (and real life) that are easily conveyed using the content of discrete mathematics.

Problem Solving and Reasoning with Discrete Mathematics can be used for a one- or two-semester course for high school students of all ages and abilities or for college students, particularly those who intend to become elementary or middle school teachers of mathematics.

Problem Solving and Reasoning with Discrete Mathematics consists of a textbook and an “Activity Book.” Unlike the conventional textbook that provides problems at the end of each section, *Problem Solving and Reasoning with Discrete Mathematics* is intended to be used interactively by the reader. That is, the reader is expected to read a passage and then do an “activity,” which will involve problems based on the passage that he or she has just read. After that, the reader goes on to the next passage and the next activity, etc. The problems in the “activity” are provided in the text, but the “Activity Book” provides format and space where the reader can actually do the activity.

Each page in *Problem Solving and Reasoning with Discrete Mathematics* is divided into two columns. The column at the right is the main text; the column at the left (referred to as “the side column”) contains notes that expand on topics mentioned briefly in the text, provides reflections on the problem solving, modeling, and reasoning that appears in the text, and provides space for the many diagrams that appear in the book.

Problem Solving and Reasoning with Discrete Mathematics addresses five types of issues related to problem solving and reasoning: (a) strategies for solving problems, (b) thinking and acting systematically, (c) mathematical reasoning, (d) mathematical modeling, and (e) mathematical practice. Although many of the mathematical topics in this book are not addressed in the current version of the Common Core State Standards, these five types of issues play a major role in what the standards refer to as “Standards for Mathematical Practice.” These five types of issues are not addressed in separate sections of the book; rather, they are addressed as they arise in the discussion of the mathematical topics under investigation. At the end of each chapter, a summary is provided of how these issues were dealt with in the chapter.

For the Instructor

Those who adopt *Problem Solving and Reasoning with Discrete Mathematics* for classroom use will also receive two Word documents – an *Instructors’ Guide* to using the text and *Comments and Solutions on the Activities*.