

<<Math Made Visual数学创>>

图书基本信息

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内容概要

The object of this book is to show how visualization techniques may be employed to produce pictures that have interest for the creation, communication and teaching of mathematics. Mathematical drawings related to proofs have been produced since antiquity in China, Arabia, Greece and India but only in the last thirty years has there been a growing interest in so-called 'proofs without words.' In this book the authors show that behind most of the pictures 'proving' mathematical relations are some well-understood methods. The first part of the book consists of twenty short chapters, each one describing a method to visualize some mathematical idea (a proof, a concept, an operation,...) and several applications to concrete cases. Following this the book examines general pedagogical considerations concerning the development of visual thinking, practical approaches for making visualizations in the classroom and a discussion of the role that hands-on material plays in this process.

书籍目录

Introduction; Part I : Visualizing Mathematics by Creating Pictures 1. Representing numbers by graphical elements 2. Representing numbers by lengths of segments 3. Representing numbers by areas of plane figures 4. Representing numbers by volumes of bodies 5. Identifying key elements 6. Employing isometry 7. Employing similarity 8. Area preserving transformations 9. Escaping from the plan 10. Overlaying tiles 11. Playing with several copies 12. Sequential frames 13. Geometric dissections 14. Moving frames 15. Iterative procedures 16. Introducing colors 17. Visualization by inclusion 18. Ingenuity in 3D 19. Using 3D models 20. Combining techniquesPart II : Visualization in the ClassroomPartIII : Hints and Solutions to the ChallengesReferencesIndex

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