Título: Shape Of Algebra In The Mirrors Of Mathematics. (With Cd Rom)

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The Shape of Algebra in the Mirrors of Mathematics is a unique text aiming to explain some elements of modern mathematics and to show its flavor and unity. It is neither a standard textbook nor a tour of algebra for a casual reader. Rather, it is an attempt to share authors' mathematical experiences and philosophy with readers who have more than a passing interest in mathematics, but only a traditional exposure to High School Algebra and some elements of Calculus. The book gives the readers a sense of visual nature of significant part of mathematics.

The reader becomes an owner of and a researcher in VisuMatica, a virtual math laboratory. It is an original and comprehensive PC software package (a brainchild of the second author) that will enable the reader to experience mathematics both as a human intellectual endeavor and as an experimental science. Although it is possible to read and appreciate the book without ever visiting the VisuMatica lab, those who engage with the interactive demos found in the lab will greatly advance their understanding of the text. The book seeks to encourage an interactive, investigative style of learning that can promote the habits of mind characteristic of modern mathematical thinking.

An outline of the topics that are discussed may read like a list of graduate courses: Abstract Algebra, Topology, Singularity Theory, Complex Analysis, and Number Theory. However, they are presented from an intuitive perspective that uses primarily visual models and concepts. Although the main subject is polynomials and polynomial equations, the true story line is the interplay between basic ideas from algebra, geometry, analysis and topology.

The Shape of Algebra might serve as a text for an "appreciation" course in modern mathematics designed for non-mathematics majors or for students who are considering majoring in mathematics or related disciplines. The authors' goal is to present the reader with a fresh viewpoint on the sense and flavor of mathematics. The subject is often presented in a fashion that students find stale and uncompelling. The book's emphasis, in contrast, is on how a modern

practitioner thinks about and works within the discipline.

The book aims to attract students of all ages, particularly including professional mathematicians interested in pedagogy. In part, The Shape of Algebra is directed at secondary and college teachers and students who want to expand their horizons in the field and to find both a fresh presentation of familiar concepts and, perhaps, some unexpected results. Many of the topics and demos are self-contained and can be used individually to enhance traditional courses. Several of the ideas and materials developed in the book have been tested in high school and college classrooms.

The book will enable readers to approach its content on three levels: the first level requires only some fluency with routine algebraic manipulations; the second also presumes familiarity with the notions of derivatives, and the third uses some basic concepts of multivariable calculus and linear algebra. All three levels are clearly marked in the text, and allow for a smooth reading enhanced by virtual experiments.