



Geometry and Its Applications, Second Edition

By Walter A. Meyer

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Meyer's *Geometry and Its Applications, Second Edition*, combines traditional geometry with current ideas to present a modern approach that is grounded in real-world applications. It balances the deductive approach with discovery learning, and introduces axiomatic, Euclidean geometry, non-Euclidean geometry, and transformational geometry. The text integrates applications and examples throughout and includes historical notes in many chapters.

The Second Edition of *Geometry and Its Applications* is a significant text for any college or university that focuses on geometry's usefulness in other disciplines. It is especially appropriate for engineering and science majors, as well as future mathematics teachers.

* Realistic applications integrated throughout the text, including (but not limited to):

- Symmetries of artistic patterns
- Physics
- Robotics
- Computer vision
- Computer graphics
- Stability of architectural structures
- Molecular biology
- Medicine
- Pattern recognition

* Historical notes included in many chapters

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Editorial Review

Review

MAA REVIEW

[Reviewed by Fernando Q. Gouvêa, on 03/25/2006]

OK, I'll admit it. I didn't think I was going to like this book. But it surprised me. It is, in my opinion, just the sort of thing its intended audience needs, and quite well executed.

Most American mathematics departments offer a regular course in geometry, usually aimed mostly at future teachers. Given that students now arrive in college with very little geometrical knowledge, these courses have settled on a fairly standard pattern. First, one does a little synthetic geometry, following Euclid as modified by Hilbert, in more or less detail and at varying levels of rigor. Next comes some (still synthetic) non-Euclidean geometry, usually very lightly done. At that point, coordinates, vectors, and transformations can come in, which creates the opportunity to introduce various other kinds of geometry (especially projective) and/or to spend some time considering symmetries of the plane and related topics (Meyer does the latter). From there on, one is free to consider special topics; Meyer chooses to do a little bit of the theory of polyhedra.

All this is fairly standard, as is the provision, made through a web site, of software support (in this case, using Geometer's Sketchpad). What makes Meyer's book stand out are two things. First, he puts to good use his experience in industry (at Grumman Corporation, where he ran a robotics research program) in order to present applications that, while usually simple, seem real. This includes some fairly important (and non-classical) material, such as a discussion of Voronoi diagrams.

The second is harder to pin down; I'd describe it as the book's "voice": a humane, intelligent, reflective way of discussing things that is quite interesting to read. Read his discussion of what axioms are, early in the first chapter, to see what I mean. If we can get students to read the book and think about what they read, they'll learn a lot from this book.

So: this may look fairly traditional (especially from the outside), but it's actually quite creative and very well done. Anyone teaching this kind of geometry course should consider adopting this book.

-- Fernando Q. Gouvêa is professor of mathematics at Colby College

From the Back Cover

Walter Meyer's *Geometry and its Applications* extends a first college-level course in geometry to include applications and contemporary topics. This text combines traditional geometry with ideas of recent decades to present a new approach for the 21st century.

The text introduces axiomatic Euclidean geometry, non-Euclidean geometry, and transformational geometry. It balances the deductive approach and the coordinate approach with discovery learning.

Geometry and its Applications offers a breadth of traditional and contemporary applications, including symmetries of artistic patterns, physics, robotics, computer graphics, molecular biology, medicine, and more. Walter Meyer is experienced in employing geometry as an industrial researcher and developer and has researched and taught geometry for nearly thirty years. The National Science Foundation, COMAP, and the Sloan Foundation have supported his work.

Key Features

- * A unique blend of modern applications and theory
- * Excellent balance of mathematical rigor and informal style
- * CD-ROM (included) offers courseware for use with The Geometer's Sketchpad
- * Covers polyhedra and planar maps
- * Offers balance between deductive geometry and coordinate geometry using vectors
- * Contains over 700 exercises with complete solutions available
- * Includes Student and Instructor Guides which support the software

"this text is more interesting to read than our present text. The author writes at a more appropriate level. (He) expresses himself well especially in the historical texts, examples, and ideas."

--David E. Ewing, Central Missouri State University

"Real strengths of the text include the applications, the treatment of symmetry, and the attention to isometries. The style is conversational and the approaches to problems are sensible. I appreciate the large number of problems."

--Steven Williams, Brigham Young University

"The author's emphasis on applications sets this proposed text apart from the standard ones. His examples make the point that geometry plays a vital role in the modern world."

--Gerald E. Gannon, California State University, Fullerton

About the Author

Walter Meyer received his Ph.D. at the University of Wisconsin in 1969. He is currently a professor at Adelphi University, and visiting professor at West Point Military Academy. He has industrial experience as head of robotics research at Grumman Data Systems. He is editor of *Principles and Practice of Mathematics*, as well as a contributing author to *For All Practical Purposes*.

Users Review

From reader reviews:

Lewis Wood:

Nowadays reading books become more than want or need but also work as a life style. This reading routine give you lot of advantages. The huge benefits you got of course the knowledge the actual information inside the book in which improve your knowledge and information. The knowledge you get based on what kind of publication you read, if you want get more knowledge just go with education and learning books but if you want sense happy read one with theme for entertaining for instance comic or novel. The actual Geometry and Its Applications, Second Edition is kind of book which is giving the reader unstable experience.

Michelle Porter:

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Jerry Smith:

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Wilda Baeza:

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