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Titolo	Euclidean, Non-Euclidean, and Transformational Geometry : A Deductive Inquiry / / by Shlomo Libeskind, Isa S. Jubran
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ISBN	3-031-74153-6
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (680 pages)
Altri autori (Persone)	JubranIsa S
Disciplina	516
Soggetti	Convex geometry Discrete geometry Projective geometry Geometry, Hyperbolic Convex and Discrete Geometry Projective Geometry Hyperbolic Geometry
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Preface -- Surprising Results and Basic Notions -- Congruence, Constructions, and the Parallel Postulate -- Circles -- Area and the Pythagorean Theorem -- Similarity -- Isometries and Size Transformations -- Composition of Transformations -- More Recent Discoveries -- Inversion -- Hyperbolic Geometry -- Elliptic Geometries -- Projective Geometry -- Taxicab Geometry -- Fractal Geometry -- Solid Geometry.
Sommario/riassunto	This undergraduate textbook provides a comprehensive treatment of Euclidean and transformational geometries, supplemented by substantial discussions of topics from various non-Euclidean and less commonly taught geometries, making it ideal for both mathematics majors and pre-service teachers. Emphasis is placed on developing students' deductive reasoning skills as they are guided through proofs, constructions, and solutions to problems. The text frequently emphasizes strategies and heuristics of problem solving including constructing proofs (Where to begin? How to proceed? Which approach

is more promising? Are there multiple solutions/proofs? etc.). This approach aims not only to enable students to successfully solve unfamiliar problems on their own, but also to impart a lasting appreciation for mathematics. The text first explores, at a higher level and in much greater depth, topics that are normally taught in high school geometry courses: definitions and axioms, congruence, circles and related concepts, area and the Pythagorean theorem, similarity, isometries and size transformations, and composition of transformations. Constructions and the use of transformations to carry out constructions are emphasized. The text then introduces more advanced topics dealing with non-Euclidean and less commonly taught topics such as inversive, hyperbolic, elliptic, taxicab, fractal, and solid geometries. By examining what happens when one or more of the building blocks of Euclidean geometry are altered, students will gain a deeper understanding of and appreciation for Euclidean concepts. To accommodate students with different levels of experience in the subject, the basic definitions and axioms that form the foundation of Euclidean geometry are covered in Chapter 1. Problem sets are provided after every section in each chapter and include nonroutine problems that students will enjoy exploring. While not necessarily required, the appropriate use of freely available dynamic geometry software and other specialized software referenced in the text is strongly encouraged; this is especially important for visual learners and for forming conjectures and testing hypotheses.