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Titolo	Cool Math for Hot Music : A First Introduction to Mathematics for Music Theorists // by Guerino Mazzola, Maria Mannone, Yan Pang
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2016
ISBN	3-319-42937-X
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (XV, 323 p. 179 illus., 112 illus. in color.)
Collana	Computational Music Science, , 1868-0305
Disciplina	781.0151
Soggetti	Application software Music Mathematics Computer science—Mathematics Artificial intelligence Computer Appl. in Arts and Humanities Mathematics in Music Mathematics of Computing Artificial Intelligence
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Part I: Introduction and Short History -- The 'Counterpoint' of Mathematics and Music -- Short History of the Relationship Between Mathematics and Music -- Part II: Sets and Functions -- The Architecture of Sets -- Functions and Relations -- Universal Properties -- Part III: Numbers -- Natural Numbers -- Recursion -- Natural Arithmetic -- Euclid and Normal Forms -- Integers -- Rationals -- Real Numbers -- Roots, Logarithms, and Normal Forms -- Complex Numbers -- Part IV: Graphs and Nerves -- Directed and Undirected Graphs -- Nerves -- Part V: Monoids and Groups -- Monoids -- Groups -- Group Actions, Subgroups, Quotients, and Products -- Permutation Groups -- The Third Torus and Counterpoint -- Coltrane's Giant Steps -- Modulation Theory -- Part VI: Rings and Modules -- Rings and Fields -- Primes -- Matrices -- Modules -- Just Tuning -- Categories -- Part VII: Continuity and Calculus -- Continuity --

Differentiability -- Performance -- Gestures -- Part VIII: Solutions, References, Index -- Solutions of Exercises -- References -- Index.

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Sommario/riassunto

This textbook is a first introduction to mathematics for music theorists, covering basic topics such as sets and functions, universal properties, numbers and recursion, graphs, groups, rings, matrices and modules, continuity, calculus, and gestures. It approaches these abstract themes in a new way: Every concept or theorem is motivated and illustrated by examples from music theory (such as harmony, counterpoint, tuning), composition (e.g., classical combinatorics, dodecaphonic composition), and gestural performance. The book includes many illustrations, and exercises with solutions.

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