

Redefining Geometrical Exactness Descartes Transformation Of The Early Modern Concept Of Construction Sources And Studies In The History Of Mathematics And Physical Sciences

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Descartes and the Ingenium - Raphaële Garrod 2020-11-23

A historically-informed account of the lasting importance of embodied thought in the intellectual trajectory of René Descartes, still remembered today as the founding father of dualism.

Classical Mathematics from Al-Khwarizmi to Descartes - Roshdi Rashed 2014-08-21

This book follows the development of classical mathematics and the relation between work done in the Arab and Islamic worlds and that undertaken by the likes of Descartes and Fermat. 'Early modern,' mathematics is a term widely used to refer to the mathematics which developed in the West during the

sixteenth and seventeenth century. For many historians and philosophers this is the watershed which marks a radical departure from 'classical mathematics,' to more modern mathematics; heralding the arrival of algebra, geometrical algebra, and the mathematics of the continuous. In this book, Roshdi Rashed demonstrates that 'early modern,' mathematics is actually far more composite than previously assumed, with each branch having different traceable origins which span the millennium. Going back to the beginning of these parts, the aim of this book is to identify the concepts and practices of key figures in their development, thereby presenting a fuller reality of these mathematics. This book will be of

interest to students and scholars specialising in Islamic science and mathematics, as well as to those with an interest in the more general history of science and mathematics and the transmission of ideas and culture.

Encyclopedia of Early Modern Philosophy and the Sciences - Dana Jalobeanu 2022-08-27

This Encyclopedia offers a fresh, integrated and creative perspective on the formation and foundations of philosophy and science in European modernity. Combining careful contextual reconstruction with arguments from traditional philosophy, the book examines methodological dimensions, breaks down traditional oppositions such as rationalism vs. empiricism, calls attention to gender issues, to 'insiders and outsiders', minor figures in philosophy, and underground movements, among many other topics. In addition, and in line with important recent transformations in the fields of history of science and early modern philosophy, the volume recognizes the specificity and significance of early modern science and discusses important developments including issues of historiography (such as historical epistemology), the interplay between the material culture and modes of knowledge, expert knowledge and craft knowledge. This book stands at the crossroads of different disciplines and combines their approaches – particularly the history of science, the history of philosophy, contemporary philosophy of science, and intellectual and cultural history. It brings together over 100 philosophers, historians of science, historians of mathematics, and medicine offering a comprehensive view of early modern philosophy and the sciences. It combines and discusses recent results from two

very active fields: early modern philosophy and the history of (early modern) science. Editorial Board EDITORS-IN-CHIEF Dana Jalobeanu University of Bucharest, Romania Charles T. Wolfe Ghent University, Belgium ASSOCIATE EDITORS Delphine Bellis University Nijmegen, The Netherlands Zvi Biener University of Cincinnati, OH, USA Angus Gowland University College London, UK Ruth Hagenruber University of Paderborn, Germany Hiro Hirai Radboud University Nijmegen, The Netherlands Martin Lenz University of Groningen, The Netherlands Gideon Manning CalTech, Pasadena, CA, USA Silvia Manzo University of La Plata, Argentina Enrico Pasini University of Turin, Italy Cesare Pastorino TU Berlin, Germany Lucian Petrescu Université Libre de Bruxelles, Belgium Justin E. H. Smith University de Paris Diderot, France Marius Stan Boston College, Chestnut Hill, MA, USA Koen Vermeir CNRS-SPHERE + Université de Paris, France Kirsten Walsh University of Calgary, Alberta, Canada

A Brief History of Analysis - Detlef D. Spalt 2022-09-03

This book explores the origins of mathematical analysis in an accessible, clear, and precise manner. Concepts such as function, continuity, and convergence are presented with a unique historical point of view. In part, this is accomplished by investigating the impact of and connections between famous figures, like Newton, Leibniz, Johann Bernoulli, Euler, and more. Of particular note is the treatment of Karl Weierstraß, whose concept of real numbers has been frequently overlooked until now. By providing such a broad yet detailed survey, this book examines how analysis was formed, how it has changed over time, and how it continues to evolve today. *A Brief History of Analysis* will appeal to a wide audience of

students, instructors, and researchers who are interested in discovering new historical perspectives on otherwise familiar mathematical ideas.

Visioning Technologies - Graham Cairns 2016-12-08

Visioning Technologies brings together a collection of texts from leading theorists to examine how architecture has been, and is, reframed and restructured by the visual and theoretical frameworks introduced by different 'technologies of sight' – understood to include orthographic projection, perspective drawing, telescopic devices, photography, film and computer visualization, amongst others. Each chapter deals with its own area and historical period of expertise, organized sequentially to mark out and analyse the historical evolution of how architecture has been transformed by technologically induced shifts in human perception from the 15th century until today. This book underlines the way in which architectural forms and design processes have developed historically in conjunction with the systems of sight we manufacture technologically and suggests this continues today. Paradoxically, it is premised on the argument that these technological systems tend, in their initial formulations, to obtain ever greater realism in our visualizations of the physical world.

Real, Mechanical, Experimental -

Francesco G. Sacco 2020-06-29

This original work contains the first detailed account of the natural philosophy of Robert Hooke (1635-1703), leading figure of the early Royal Society. From celestial mechanics to microscopy, from optics to geology and biology, Hooke's contributions to the Scientific Revolution proved decisive. Focusing separately on partial aspects of

Hooke's works, scholars have hitherto failed to see the unifying idea of the natural philosophy underlying them. Some of his unpublished papers have passed almost unnoticed. Hooke pursued the foundation of a real, mechanical and experimental philosophy, and this book is an attempt to reconstruct it. The book includes a selection of Hooke's unpublished papers. Readers will discover a study of the new science through the works of one of the most known protagonists. Challenging the current views on the scientific life of restoration England, this book sheds new light on the circulation of Baconian ideals and the mechanical philosophy in the early Royal Society. This book is a must-read to anybody interested in Hooke, early modern science or Restoration history.

Coding as Literacy - Vera Bühlmann 2015-07-24

Recent developments in computer science, particularly "data-driven procedures" have opened a new level of design and engineering. This has also affected architecture. The publication collects contributions on Coding as Literacy by computer scientists, mathematicians, philosophers, cultural theorists, and architects. The main focus in the book is the observation of computer-based methods that go beyond strictly case-based or problem-solution-oriented paradigms. This invites readers to understand Computational Procedures as being embedded in an overarching "media literacy" that can be revealed through, and acquired by, "computational literacy", and to consider the data processed in the above-mentioned methods as being beneficial in terms of quantum physics. "Self-Organizing Maps" (SOM), which were first introduced over 30 years ago, will serve as the concrete reference point for all

further discussions.

Turning Points in the History of Mathematics

- Hardy Grant 2016-04-15

This book explores some of the major turning points in the history of mathematics, ranging from ancient Greece to the present, demonstrating the drama that has often been a part of its evolution. Studying these breakthroughs, transitions, and revolutions, their stumbling-blocks and their triumphs, can help illuminate the importance of the history of mathematics for its teaching, learning, and appreciation. Some of the turning points considered are the rise of the axiomatic method (most famously in Euclid), and the subsequent major changes in it (for example, by David Hilbert); the "wedding," via analytic geometry, of algebra and geometry; the "taming" of the infinitely small and the infinitely large; the passages from algebra to algebras, from geometry to geometries, and from arithmetic to arithmetics; and the revolutions in the late nineteenth and early twentieth centuries that resulted from Georg Cantor's creation of transfinite set theory. The origin of each turning point is discussed, along with the mathematicians involved and some of the mathematics that resulted. Problems and projects are included in each chapter to extend and increase understanding of the material. Substantial reference lists are also provided. *Turning Points in the History of Mathematics* will be a valuable resource for teachers of, and students in, courses in mathematics or its history. The book should also be of interest to anyone with a background in mathematics who wishes to learn more about the important moments in its development.

Redefining Geometrical Exactness

- Henk J.M. Bos 2012-12-06

In his "Géométrie" of 1637 Descartes

achieved a monumental innovation of mathematical techniques by introducing what is now called analytic geometry. Yet the key question of the book was foundational rather than technical: When are geometrical objects known with such clarity and distinctness as befits the exact science of geometry? Classically, the answer was sought in procedures of geometrical construction, in particular by ruler and compass, but the introduction of new algebraic techniques made these procedures insufficient. In this detailed study, spanning essentially the period from the first printed edition of Pappus' "Collection" (1588, in Latin translation) and Descartes' death in 1650, Bos explores the current ideas about construction and geometrical exactness, noting that by the time Descartes entered the field the incursion of algebraic techniques, combined with an increasing uncertainty about the proper means of geometrical problem solving, had produced a certain impasse. He then analyses how Descartes transformed geometry by a redefinition of exactness and by a demarcation of geometry's proper subject and procedures in such a way as to incorporate the use of algebraic methods without destroying the true nature of geometry. Although mathematicians later essentially discarded Descartes' methodological convictions, his influence was profound and pervasive. Bos' insistence on the foundational aspects of the "Géométrie" provides new insights both in the genesis of Descartes' masterpiece and in its significance for the development of the conceptions of mathematical exactness.

Descartes's Mathematical Thought

- C. Sasaki 2013-03-09

Covering both the history of

mathematics and of philosophy, Descartes's *Mathematical Thought* reconstructs the intellectual career of Descartes most comprehensively and originally in a global perspective including the history of early modern China and Japan. Especially, it shows what the concept of "mathesis universalis" meant before and during the period of Descartes and how it influenced the young Descartes. In fact, it was the most fundamental mathematical discipline during the seventeenth century, and for Descartes a key notion which may have led to his novel mathematics of algebraic analysis.

The Cambridge Companion to Newton - Rob Iliffe 2016-04-07

This new edition includes three updated chapters, a revised bibliography, new introduction and three entirely new chapters.

Secondary Algebra Education: Revisiting Topics and Themes and Exploring the Unknown - Paul Drijvers 2011-10-19

Nowadays, algebra education is subject to worldwide scrutiny. Different opinions on its goals, approaches and achievements are at the heart of debates among teachers, educators, researchers and decision makers. What should the teaching of algebra in secondary school mathematics look like? Should it focus on procedural skills or on algebraic insight? Should it stress practice or integrate technology? Do we require formal proofs and notations, or do informal representations suffice? Is algebra in school an abstract subject, or does it take its relevance from application in (daily life) contexts? What should secondary school algebra education that prepares for higher education and professional practice in the twenty-first century look like? This book addresses these questions, and aims to inform in-

service and future teachers, mathematics educators and researchers on recent insights in the domain, and on specific topics and themes such as the historical development of algebra, the role of productive practice, and algebra in science and engineering in particular. The authors, all affiliated with the Freudenthal Institute for Science and Mathematics Education in the Netherlands, share a common philosophy, which acts as a ? sometimes nearly invisible ? backbone for the overall view on algebra education: the theory of realistic mathematics education. From this point of departure, different perspectives are chosen to describe the opportunities and pitfalls of today's and tomorrow's algebra education. Inspiring examples and reflections illustrate current practice and explore the unknown future of algebra education to appropriately meet students' needs.

Geometry from a Differentiable Viewpoint - John McCleary 2013

A thoroughly revised second edition of a textbook for a first course in differential/modern geometry that introduces methods within a historical context.

Representation and Productive Ambiguity in Mathematics and the Sciences - Emily R. Grosholz 2007-08-30

Emily Grosholz offers an original investigation of demonstration in mathematics and science, examining how it works and why it is persuasive. Focusing on geometrical demonstration, she shows the roles that representation and ambiguity play in mathematical discovery. She presents a wide range of case studies in mechanics, topology, algebra, logic, and chemistry, from ancient Greece to the present day, but focusing particularly on the seventeenth and twentieth centuries.

She argues that reductive methods are effective not because they diminish but because they multiply and juxtapose modes of representation. Such problem-solving is, she argues, best understood in terms of Leibnizian 'analysis' - the search for conditions of intelligibility. Discovery and justification are then two aspects of one rational way of proceeding, which produces the mathematician's formal experience. Grosholz defends the importance of iconic, as well as symbolic and indexical, signs in mathematical representation, and argues that pragmatic, as well as syntactic and semantic, considerations are indispensable for mathematical reasoning. By taking a close look at the way results are presented on the page in mathematical (and biological, chemical, and mechanical) texts, she shows that when two or more traditions combine in the service of problem solving, notations and diagrams are subtly altered, multiplied, and juxtaposed, and surrounded by prose in natural language which explains the novel combination. Viewed this way, the texts yield striking examples of language and notation that are irreducibly ambiguous and productive because they are ambiguous. Grosholtz's arguments, which invoke Descartes, Locke, Hume, and Kant, will be of considerable interest to philosophers and historians of mathematics and science, and also have far-reaching consequences for epistemology and philosophy of language.

Oxford Studies in Early Modern Philosophy, Volume X - Donald Rutherford 2021-07-01

Oxford Studies in Early Modern Philosophy is an annual series, presenting a selection of the best current work in the history of early modern philosophy. It focuses on the

seventeenth and eighteenth centuries - the extraordinary period of intellectual flourishing that begins, very roughly, with Descartes and his contemporaries and ends with Kant. It also publishes papers on thinkers or movements outside of that framework, provided they are important in illuminating early modern thought. The articles in OSEMP will be of importance to specialists within the discipline, but the editors also intend that they should appeal to a larger audience of philosophers, intellectual historians, and others who are interested in the development of modern thought.

Descartes: A Biography - Desmond M. Clarke 2006-03-06

René Descartes is best remembered today for writing 'I think, therefore I am', but his main contribution to the history of ideas was his effort to construct a philosophy that would be sympathetic to the new sciences that emerged in the seventeenth century. To a great extent he was the midwife to the Scientific Revolution and a significant contributor to its key concepts. In four major publications, he fashioned a philosophical system that accommodated the needs of these new sciences and thereby earned the unrelenting hostility of both Catholic and Calvinist theologians, who relied on the scholastic philosophy that Descartes hoped to replace. His contemporaries claimed that his proofs of God's existence in the Meditations were so unsuccessful that he must have been a cryptic atheist and that his discussion of skepticism served merely to fan the flames of libertinism. This is the first biography in English that addresses the full range of Descartes' interest in theology, philosophy and the sciences and that traces his intellectual development through his entire career.

Phenomenology and the Human

Positioning in the Cosmos - Anna-Teresa Tymieniecka 2012-10-11

The classic conception of human transcendental consciousness assumes its self-supporting existential status within the horizon of life-world, nature and earth. Yet this assumed absoluteness does not entail the nature of its powers, neither their constitutive force. This latter call for an existential source reaching beyond the generative life-world network. Transcendental consciousness, having lost its absolute status (its point of reference) it is the role of the logos to lay down the harmonious positioning in the cosmic sphere of the all, establishing an original foundation of phenomenology in the primogenital onto-poiesis of life. □

Selected Essays on Pre- and Early Modern Mathematical Practice - Jens Høyrup 2019-09-20

This book presents a broad selection of articles mainly published during the last two decades on a variety of topics within the history of mathematics, mostly focusing on particular aspects of mathematical practice. This book is of interest to, and provides methodological inspiration for, historians of science or mathematics and students of these disciplines.

Unifying Heaven and Earth. Essays in the History of Early Modern Cosmology - Miguel Á. Granada 2016-05-26

One of the most significant events in the history of Western civilization was the cosmological revolution of the 16th and 17th centuries. Among the most salient factors in this change, described by Alexandre Koyré as the 'destruction of the cosmos' inherited from ancient Greece, were Copernican heliocentrism and the substitution of a homogeneous universe for the hierarchical cosmos of the Platonic and Aristotelian

tradition. Starting with a new approach to the issue of the presence of Islamic astronomical devices in Copernicus' work and a thorough reappraisal of the cosmological views of Paracelsus, the book deals mainly with the abolition of cosmological dualism and the ways in which it affected the decline of astrology over the 17th century. Other related topics include planetary order and theories of world harmony, the cause of planetary motion in the Tychonic world system or the discussion on comets in Germany through the first presentation of a manuscript treatise by Michael Maestlin on the great comet of 1618.

Research in History and Philosophy of Mathematics - Maria Zack 2015-11-10

This volume contains thirteen papers that were presented at the 2014 Annual Meeting of the Canadian Society for History and Philosophy of Mathematics/La Société Canadienne d'Histoire et de Philosophie des Mathématiques, held on the campus of Brock University in St. Catharines, Ontario, Canada. It contains rigorously reviewed modern scholarship on general topics in the history and philosophy of mathematics, as well as on the meeting's special topic, Early Scientific Computation. These papers cover subjects such as •Physical tools used by mathematicians in the seventeenth century •The first historical appearance of the game-theoretical concept of mixed-strategy equilibrium •George Washington's mathematical cyphering books •The development of the Venn diagram •The role of Euler and other mathematicians in the development of algebraic analysis •Arthur Cayley and Alfred Kempe's influence on Charles Peirce's diagrammatic logic •The influence publishers had on the development of mathematical pedagogy in the nineteenth century •A

description of the 1924 International Mathematical Congress held in Toronto, told in the form of a "narrated slide show" Written by leading scholars in the field, these papers will be accessible to not only mathematicians and students of the history and philosophy of mathematics, but also anyone with a general interest in mathematics.

Leibniz and the Structure of Sciences

- Vincenzo De Risi 2020-01-01

The book offers a collection of essays on various aspects of Leibniz's scientific thought, written by historians of science and world-leading experts on Leibniz. The essays deal with a vast array of topics on the exact sciences: Leibniz's logic, mereology, the notion of infinity and cardinality, the foundations of geometry, the theory of curves and differential geometry, and finally dynamics and general epistemology. Several chapters attempt a reading of Leibniz's scientific works through modern mathematical tools, and compare Leibniz's results in these fields with 19th- and 20th-Century conceptions of them. All of them have special care in framing Leibniz's work in historical context, and sometimes offer wider historical perspectives that go much beyond Leibniz's researches. A special emphasis is given to effective mathematical practice rather than purely epistemological thought. The book is addressed to all scholars of the exact sciences who have an interest in historical research and Leibniz in particular, and may be useful to historians of mathematics, physics, and epistemology, mathematicians with historical interests, and philosophers of science at large.

The Oxford Guide to the History of Physics and Astronomy - J. L.

Heilbron 2005-06-03

The history of physics and astronomy from the Renaissance to the present day is traced in this collection of more than one hundred and fifty entries about key scientists, concepts, discoveries, technological innovations, and learned institutions.

The Best Writing on Mathematics 2016

- Mircea Pitici 2017-03-07

The year's finest mathematics writing from around the world This annual anthology brings together the year's finest mathematics writing from around the world. Featuring promising new voices alongside some of the foremost names in the field, The Best Writing on Mathematics 2016 makes available to a wide audience many articles not easily found anywhere else—and you don't need to be a mathematician to enjoy them. These writings offer surprising insights into the nature, meaning, and practice of mathematics today. They delve into the history, philosophy, teaching, and everyday occurrences of math, and take readers behind the scenes of today's hottest mathematical debates. Here Burkard Polster shows how to invent your own variants of the Spot It! card game, Steven Strogatz presents young Albert Einstein's proof of the Pythagorean Theorem, Joseph Dauben and Marjorie Senechal find a treasure trove of math in New York's Metropolitan Museum of Art, and Andrew Gelman explains why much scientific research based on statistical testing is spurious. In other essays, Brian Greene discusses the evolving assumptions of the physicists who developed the mathematical underpinnings of string theory, Jorge Almeida examines the misperceptions of people who attempt to predict lottery results, and Ian Stewart offers advice to authors who aspire to write successful math books for general readers. And there's much,

much more. In addition to presenting the year's most memorable writings on mathematics, this must-have anthology includes a bibliography of other notable writings and an introduction by the editor, Mircea Pitici. This book belongs on the shelf of anyone interested in where math has taken us—and where it is headed.

Landmark Writings in Western Mathematics 1640-1940 - Ivor Grattan-Guinness 2005-02-11

This book contains around 80 articles on major writings in mathematics published between 1640 and 1940. All aspects of mathematics are covered: pure and applied, probability and statistics, foundations and philosophy. Sometimes two writings from the same period and the same subject are taken together. The biography of the author(s) is recorded, and the circumstances of the preparation of the writing are given. When the writing is of some lengths an analytical table of its contents is supplied. The contents of the writing is reviewed, and its impact described, at least for the immediate decades. Each article ends with a bibliography of primary and secondary items. First book of its kind Covers the period 1640-1940 of massive development in mathematics Describes many of the main writings of mathematics Articles written by specialists in their field

How Modern Science Came Into the World - H. F. Cohen 2010

Once upon a time 'The Scientific Revolution of the 17th century' was an innovative concept that inspired a stimulating narrative of how modern science came into the world. Half a century later, what we now know as 'the master narrative' serves rather as a strait-jacket - so often events and contexts just fail to fit in. No attempt has been made so far to replace the master narrative. H. Floris Cohen now comes up with

precisely such a replacement. Key to his path-breaking analysis-cum-narrative is a vision of the Scientific Revolution as made up of six distinct yet narrowly interconnected, revolutionary transformations, each of some twenty-five to thirty years' duration. This vision enables him to explain how modern science could come about in Europe rather than in Greece, China, or the Islamic world. It also enables him to explain how half-way into the 17th century a vast crisis of legitimacy could arise and, in the end, be overcome.

Transcendental Curves in the Leibnizian Calculus - Viktor Blasjo 2017-04-22

Transcendental Curves in the Leibnizian Calculus analyzes the mathematical and philosophical conflict between Euclidean and Cartesian mathematics. For millennia, mathematical meaning and ontology had been anchored in geometrical constructions, as epitomized by Euclid's ruler and compass. As late as 1637, Descartes had placed himself squarely in this tradition when he justified his new technique of identifying curves with equations by means of certain curve-tracing instruments, thereby bringing together the ancient constructive tradition and modern algebraic methods in a satisfying marriage. But rapid advances in the new fields of infinitesimal calculus and mathematical mechanics soon ruined his grand synthesis. Descartes's scheme left out transcendental curves, i.e. curves with no polynomial equation, but in the course of these subsequent developments such curves emerged as indispensable. It was becoming harder and harder to juggle cutting-edge mathematics and ancient conceptions of its foundations at the same time, yet leading mathematicians, such as

Leibniz felt compelled to do precisely this. The new mathematics fit more naturally an analytical conception of curves than a construction-based one, yet no one wanted to betray the latter, as this was seen as virtually tantamount to stop doing mathematics altogether. The credibility and authority of mathematics depended on it. Brings to light this underlying and often implicit complex of concerns that permeate early calculus Evaluates the technical conception and mathematical construction of the geometrical method Reveals a previously unrecognized Leibnizian programmatic cohesion in early calculus Provides a beautifully written work of outstanding original scholarship

The Princeton Companion to Mathematics - Timothy Gowers
2010-07-18

This is a one-of-a-kind reference for anyone with a serious interest in mathematics. Edited by Timothy Gowers, a recipient of the Fields Medal, it presents nearly two hundred entries, written especially for this book by some of the world's leading mathematicians, that introduce basic mathematical tools and vocabulary; trace the development of modern mathematics; explain essential terms and concepts; examine core ideas in major areas of mathematics; describe the achievements of scores of famous mathematicians; explore the impact of mathematics on other disciplines such as biology, finance, and music--and much, much more. Unparalleled in its depth of coverage, The Princeton Companion to Mathematics surveys the most active and exciting branches of pure mathematics. Accessible in style, this is an indispensable resource for undergraduate and graduate students in mathematics as well as for researchers and scholars seeking to understand areas outside their specialties. Features nearly

200 entries, organized thematically and written by an international team of distinguished contributors Presents major ideas and branches of pure mathematics in a clear, accessible style Defines and explains important mathematical concepts, methods, theorems, and open problems Introduces the language of mathematics and the goals of mathematical research Covers number theory, algebra, analysis, geometry, logic, probability, and more Traces the history and development of modern mathematics Profiles more than ninety-five mathematicians who influenced those working today Explores the influence of mathematics on other disciplines Includes bibliographies, cross-references, and a comprehensive index Contributors include: Graham Allan, Noga Alon, George Andrews, Tom Archibald, Sir Michael Atiyah, David Aubin, Joan Bagaria, Keith Ball, June Barrow-Green, Alan Beardon, David D. Ben-Zvi, Vitaly Bergelson, Nicholas Bingham, Béla Bollobás, Henk Bos, Bodil Branner, Martin R. Bridson, John P. Burgess, Kevin Buzzard, Peter J. Cameron, Jean-Luc Chabert, Eugenia Cheng, Clifford C. Cocks, Alain Connes, Leo Corry, Wolfgang Coy, Tony Crilly, Serafina Cuomo, Mihalis Dafermos, Partha Dasgupta, Ingrid Daubechies, Joseph W. Dauben, John W. Dawson Jr., Francois de Gandt, Persi Diaconis, Jordan S. Ellenberg, Lawrence C. Evans, Florence Fasanelli, Anita Burdman Feferman, Solomon Feferman, Charles Fefferman, Della Fenster, José Ferreirós, David Fisher, Terry Gannon, A. Gardiner, Charles C. Gillispie, Oded Goldreich, Catherine Goldstein, Fernando Q. Gouvêa, Timothy Gowers, Andrew Granville, Ivor Grattan-Guinness, Jeremy Gray, Ben Green, Ian Grojnowski, Niccolò Guicciardini, Michael Harris, Ulf Hashagen, Nigel Higson, Andrew Hodges, F. E. A.

Johnson, Mark Joshi, Kiran S. Kedlaya, Frank Kelly, Sergiu Klainerman, Jon Kleinberg, Israel Kleiner, Jacek Klinowski, Eberhard Knobloch, János Kollár, T. W. Körner, Michael Krivelevich, Peter D. Lax, Imre Leader, Jean-François Le Gall, W. B. R. Lickorish, Martin W. Liebeck, Jesper Lützen, Des MacHale, Alan L. Mackay, Shahn Majid, Lech Maligranda, David Marker, Jean Mawhin, Barry Mazur, Dusa McDuff, Colin McLarty, Bojan Mohar, Peter M. Neumann, Catherine Nolan, James Norris, Brian Osserman, Richard S. Palais, Marco Panza, Karen Hunger Parshall, Gabriel P. Paternain, Jeanne Peiffer, Carl Pomerance, Helmut Pulte, Bruce Reed, Michael C. Reed, Adrian Rice, Eleanor Robson, Igor Rodnianski, John Roe, Mark Ronan, Edward Sandifer, Tilman Sauer, Norbert Schappacher, Andrzej Schinzel, Erhard Scholz, Reinhard Siegmund-Schultze, Gordon Slade, David J. Spiegelhalter, Jacqueline Stedall, Arild Stubhaug, Madhu Sudan, Terence Tao, Jamie Tappenden, C. H. Taubes, Rüdiger Thiele, Burt Totaro, Lloyd N. Trefethen, Dirk van Dalen, Richard Weber, Dominic Welsh, Avi Wigderson, Herbert Wilf, David Wilkins, B. Yandell, Eric Zaslow, Doron Zeilberger

Pappus of Alexandria: Book 4 of the Collection - Heike Sefrin-Weis
2010-04-06

Although not so well known today, Book 4 of Pappus' Collection is one of the most important and influential mathematical texts from antiquity. The mathematical vignettes form a portrait of mathematics during the Hellenistic "Golden Age", illustrating central problems – for example, squaring the circle; doubling the cube; and trisecting an angle – varying solution strategies, and the different mathematical styles within ancient geometry. This volume provides an English translation of

Collection 4, in full, for the first time, including: a new edition of the Greek text, based on a fresh transcription from the main manuscript and offering an alternative to Hultsch's standard edition, notes to facilitate understanding of the steps in the mathematical argument, a commentary highlighting aspects of the work that have so far been neglected, and supporting the reconstruction of a coherent plan and vision within the work, bibliographical references for further study.

An Algebraic Approach to Geometry - Francis Borceux 2013-11-08

This is a unified treatment of the various algebraic approaches to geometric spaces. The study of algebraic curves in the complex projective plane is the natural link between linear geometry at an undergraduate level and algebraic geometry at a graduate level, and it is also an important topic in geometric applications, such as cryptography. 380 years ago, the work of Fermat and Descartes led us to study geometric problems using coordinates and equations. Today, this is the most popular way of handling geometrical problems. Linear algebra provides an efficient tool for studying all the first degree (lines, planes) and second degree (ellipses, hyperboloids) geometric figures, in the affine, the Euclidean, the Hermitian and the projective contexts. But recent applications of mathematics, like cryptography, need these notions not only in real or complex cases, but also in more general settings, like in spaces constructed on finite fields. And of course, why not also turn our attention to geometric figures of higher degrees? Besides all the linear aspects of geometry in their most general setting, this book also describes useful algebraic tools

for studying curves of arbitrary degree and investigates results as advanced as the Bezout theorem, the Cramer paradox, topological group of a cubic, rational curves etc. Hence the book is of interest for all those who have to teach or study linear geometry: affine, Euclidean, Hermitian, projective; it is also of great interest to those who do not want to restrict themselves to the undergraduate level of geometric figures of degree one or two.

The Geometry of an Art - Kirsti Andersen 2008-11-23

This review of literature on perspective constructions from the Renaissance through the 18th century covers 175 authors, emphasizing Peiro della Francesca, Guidobaldo del Monte, Simon Stevin, Brook Taylor, and Johann Heinrich. It treats such topics as the various methods of constructing perspective, the development of theories underlying the constructions, and the communication between mathematicians and artisans in these developments.

The Oxford Handbook of the History of Physics - Jed Z. Buchwald 2013-10
Presents a history of physics, examining the theories and experimental practices of the science.

The History of Mathematics: A Source-Based Approach - June Barrow-Green 2021-12-17

The History of Mathematics: A Source-Based Approach is a comprehensive history of the development of mathematics. This, the first volume of the two-volume set, takes readers from the beginning of counting in prehistory to 1600 and the threshold of the discovery of calculus. It is notable for the extensive engagement with original—primary and secondary—source material. The coverage is worldwide, and embraces developments, including education, in Egypt, Mesopotamia, Greece, China,

India, the Islamic world and Europe. The emphasis on astronomy and its historical relationship to mathematics is new, and the presentation of every topic is informed by the most recent scholarship in the field. The two-volume set was designed as a textbook for the authors' acclaimed year-long course at the Open University. It is, in addition to being an innovative and insightful textbook, an invaluable resource for students and scholars of the history of mathematics. The authors, each among the most distinguished mathematical historians in the world, have produced over fifty books and earned scholarly and expository prizes from the major mathematical societies of the English-speaking world.

A Companion to Hobbes - Marcus P. Adams 2021-10-08

Offers comprehensive treatment of Thomas Hobbes's thought, providing readers with different ways of understanding Hobbes as a systematic philosopher. As one of the founders of modern political philosophy, Thomas Hobbes is best known for his ideas regarding the nature of legitimate government and the necessity of society submitting to the absolute authority of sovereign power. Yet Hobbes produced a wide range of writings, from translations of texts by Homer and Thucydides, to interpretations of Biblical books, to works devoted to geometry, optics, morality, and religion. Hobbes viewed himself as presenting a unified method for theoretical and practical science—an interconnected system of philosophy that provides many entry points into his thought. A Companion to Hobbes is an expertly curated collection of essays offering close textual engagement with the thought of Thomas Hobbes in his major works while probing his ideas regarding natural philosophy, mathematics,

human nature, civil philosophy, religion, and more. The Companion discusses the ways in which scholars have tried to understand the unity and diversity of Hobbes's philosophical system and examines the reception of the different parts of Hobbes's philosophy by thinkers such as René Descartes, Margaret Cavendish, David Hume, and Immanuel Kant. Presenting a diversity of fresh perspectives by both emerging and established scholars, this volume: Provides a comprehensive treatment of Hobbes's thought in his works, including Elements of Law, Elements of Philosophy, and Leviathan Explores the connecting points between Hobbes' metaphysics, epistemology, mathematics, natural philosophy, morality, and civil philosophy Offers readers strategies for understanding how the parts of Hobbes's philosophical system fit together Examines Hobbes's philosophy of mathematics and his attempts to understand geometrical objects and definitions Considers Hobbes's philosophy in contexts such as the natural state of humans, gender relations, and materialist worldviews Challenges conceptions of Hobbes's moral theory and his views about the rights of sovereigns Part of the acclaimed Blackwell Companions to Philosophy series, A Companion to Hobbes is an invaluable resource for scholars and advanced students of Early modern thought, particularly those from disciplines such as History of Philosophy, Political Philosophy, Intellectual History, History of Politics, Political Theory, and English.

Descartes's Method - Tarek Dika
2023-03-02

Tarek Dika presents a systematic account of Descartes' method and its efficacy. He develops an ontological interpretation of Descartes's method as a dynamic and, within limits,

differentiable problem-solving cognitive disposition or habitus, which can be actualized or applied to different problems in various ways, depending on the nature of the problem. Parts I-II of the book develop the foundations of such an habitual interpretation of Descartes's method, while Parts III-V demonstrate the fruits of such an interpretation in metaphysics, natural philosophy, and mathematics. This is the first book to draw on the recently-discovered Cambridge manuscript of Descartes's Rules for the Direction of the Mind (1620s): it gives a concrete demonstration of the efficacy of Descartes's method in the sciences and of the underlying unity of Descartes's method from Rules for the Direction of the Mind to Principles of Philosophy (1644).

The Oxford Handbook of Descartes and Cartesianism - Steven Nadler
2019-04-25

The Oxford Handbook of Descartes and Cartesianism comprises fifty specially written chapters on Rene Descartes (1596-1650) and Cartesianism, the dominant paradigm for philosophy and science in the seventeenth century, written by an international group of leading scholars of early modern philosophy. The first part focuses on the various aspects of Descartes's biography (including his background, intellectual contexts, writings, and correspondence) and philosophy, with chapters on his epistemology, method, metaphysics, physics, mathematics, moral philosophy, political thought, medical thought, and aesthetics. The chapters of the second part are devoted to the defense, development and modification of Descartes's ideas by later generations of Cartesian philosophers in France, the Netherlands, Italy, and elsewhere. The third and final part considers the opposition to Cartesian

philosophy by other philosophers, as well as by civil, ecclesiastic, and academic authorities. This handbook provides an extensive overview of Cartesianism - its doctrines, its legacies and its fortunes - in the period based on the latest research.

Affects, Actions and Passions in Spinoza - Chantal Jaquet 2018-01-23
Revisiting the generally accepted notion of psycho-physical parallelism in Spinoza, Chantal Jaquet offers a new analysis of the relation between body and mind. Looking at a range of Spinoza's texts, and using an original methodology, she analyses their unity in action through affects, actions and passions.

From Logic to Practice - Gabriele Lolli 2014-11-28
This book brings together young researchers from a variety of fields within mathematics, philosophy and logic. It discusses questions that arise in their work, as well as themes and reactions that appear to be similar in different contexts. The book shows that a fairly intensive activity in the philosophy of mathematics is underway, due on the one hand to the disillusionment with respect to traditional answers, on the other to exciting new features of present day mathematics. The book explains how the problem of applicability once again plays a central role in the development of mathematics. It examines how new languages different from the logical ones (mostly figural), are recognized as valid and experimented with and how unifying concepts (structure, category, set) are in competition for those who look at this form of unification. It further shows that traditional philosophies, such as constructivism, while still lively, are no longer only philosophies, but guidelines for research. Finally, the book demonstrates that the search for and validation of new axioms is

analyzed with a blend of mathematical historical, philosophical, psychological considerations.

Historical Scientific Instruments in Contemporary Education - 2021-11-15
When science's "black boxes" are pried open, its workings become accessible. Like time-travellers into history but grounded in today's cultures, learners interact directly with authentic instruments and replicas. Chapters describe educational experiences sparked through collaborations interrelating museum, school and university.

Using the Mathematics Literature - Kristine K. Fowler 2004-05-25
This reference serves as a reader-friendly guide to every basic tool and skill required in the mathematical library and helps mathematicians find resources in any format in the mathematics literature. It lists a wide range of standard texts, journals, review articles, newsgroups, and Internet and database tools for every major subfield in mathematics and details methods of access to primary literature sources of new research, applications, results, and techniques. Using the Mathematics Literature is the most comprehensive and up-to-date resource on mathematics literature in both print and electronic formats, presenting time-saving strategies for retrieval of the latest information.

Descartes's Method - Tarek R. Dika 2023-03-14
Descartes's Method develops an ontological interpretation of Descartes's method as a dynamic and, within limits, differentiable problem-solving cognitive disposition or habitus, which can be actualized or applied to different problems in various ways, depending on the nature of the problem. Parts I-II develop the foundations of an habitual interpretation of Descartes's method, while Parts III-V demonstrate the

fruits of such an interpretation in metaphysics, natural philosophy, and mathematics. The first book to draw on the recently discovered Cambridge manuscript of Descartes's Rules for the Direction of the Mind, Descartes's Method concretely

demonstrates the efficacy of Descartes's method in the sciences and the underlying unity of Descartes's method from Rules for the Direction of the Mind to Principles of Philosophy (1644).