

# Mathematics: One of the Liberal Arts

A report on Henderson State University's New General Education Mathematics Course

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## Abstract

*Recently the Department of Mathematics and Computer Science instituted a new general education mathematics course. This paper describes the process and reasoning that went into the development of the course.*

## What are the "Liberal Arts?"

Traditionally the liberal arts has referred to the Trivium and the Quadrivium.

Trivium, which comes from the Latin for "place where three roads meet, public square," was the elementary division of the seven liberal arts in medieval schools, consisting of grammar, logic and rhetoric.

Quadrivium, which comes from the Latin for "place where four ways meet," was the higher division of the seven liberal arts in the Middle Ages, composed of geometry, astronomy, arithmetic and music.

So, traditionally, the seven liberal arts are:

1. grammar
2. logic
3. rhetoric
4. geometry
5. astronomy
6. arithmetic
7. music

Clearly geometry, arithmetic, and (to a great degree) logic are mathematical concepts. It can easily be argued that astronomy is mathematical in nature. The structures of grammar and music have much in common with mathematics. Additionally, the compositional and oratorical nature of rhetoric require the kind of logical thought processes that are an integral part of mathematics.

Today, few people would probably limit the liberal arts to the original seven areas. Now, areas such as history, philosophy, literature and natural sciences ought to be included in the category of "liberal arts."

# Mathematics One Of The Liberal A

**Iain Dale, Jacqui Smith**



## **Mathematics One Of The Liberal A:**

Mathematics in Colleges & Universities Clarence Bernhart Lindquist, 1965

### **Invited Lectures from the 13th**

**International Congress on Mathematical Education** Gabriele Kaiser, Helen Forgasz, Mellony Graven, Alain Kuzniak, Elaine Simmt, Binyan Xu, 2018-02-05 The book presents the Invited Lectures given at 13th International Congress on Mathematical Education ICME 13 ICME 13 took place from 24th 31st July 2016 at the University of Hamburg in Hamburg Germany The congress was hosted by the Society of Didactics of Mathematics Gesellschaft f r Didaktik der Mathematik GDM and took place under the auspices of the International Commission on Mathematical Instruction ICMI ICME 13 the biggest ICME so far brought together about 3500 mathematics educators from 105 countries additionally 250 teachers from German speaking countries met for specific activities The scholars came together to share their work on the improvement of mathematics education at all educational levels The papers present the work of prominent mathematics educators from all over the globe and give insight into the current discussion in mathematics education The Invited Lectures cover a wide spectrum of topics themes and issues and aim to give direction to future research towards educational improvement in the teaching and learning of mathematics education This book is of particular interest to researchers teachers and curriculum developers in mathematics education

*Algebra in Context* Amy Shell-Gellasch, John Thoo, 2015-10-15 An engaging new approach to teaching algebra that takes students on a historical journey from its roots to modern times This book s unique approach to the teaching of mathematics lies in its use of history to provide a framework for understanding algebra and related fields With Algebra in Context students will soon discover why mathematics is such a crucial part not only of civilization but also of everyday life Even those who have avoided mathematics for years will find the historical stories both inviting and gripping The book s lessons begin with the creation and spread of number systems from the mathematical development of early civilizations in Babylonia Greece China Rome Egypt and Central America to the advancement of mathematics over time and the roles of famous figures such as Descartes and Leonardo of Pisa Fibonacci Before long it becomes clear that the simple origins of algebra evolved into modern problem solving Along the way the language of mathematics becomes familiar and students are gradually introduced to more challenging problems Paced perfectly Amy Shell Gellasch and J B Thoo s chapters ease students from topic to topic until they reach the twenty first century By the end of Algebra in Context students using this textbook will be comfortable with most algebra concepts including Different number bases Algebraic notation Methods of arithmetic calculation Real numbers Complex numbers Divisors Prime factorization Variation Factoring Solving linear equations False position Solving quadratic equations Solving cubic equations nth roots Set theory One to one correspondence Infinite sets Figurative numbers Logarithms Exponential growth Interest calculations

### **Making Sense of the College**

**Curriculum** Robert Zemsky, Gregory R Wegner, Ann J. Duffield, 2018-06-08 No detailed description available for Making

Sense of the College Curriculum

**General Catalogue** Syracuse University, 1927

General Catalog Issue Pennsylvania

State College, Pennsylvania State University, 1922      *Circular* United States. Office of Education, 1965      *Current Practices in Quantitative Literacy* Rick Gillman, 2006 Presents a wide sampling of efforts being made on campuses across the country to achieve our common goal of having a quantitatively literate citizenry      **The Key Reporter**, 1945      *Amherst Graduates' Quarterly*, 1929      *International Handbook of Research in History, Philosophy and Science Teaching* Michael R. Matthews, 2014-07-03 This inaugural handbook documents the distinctive research field that utilizes history and philosophy in investigation of theoretical curricular and pedagogical issues in the teaching of science and mathematics It is contributed to by 130 researchers from 30 countries it provides a logically structured fully referenced guide to the ways in which science and mathematics education is informed by the history and philosophy of these disciplines as well as by the philosophy of education more generally The first handbook to cover the field it lays down a much needed marker of progress to date and provides a platform for informed and coherent future analysis and research of the subject The publication comes at a time of heightened worldwide concern over the standard of science and mathematics education attended by fierce debate over how best to reform curricula and enliven student engagement in the subjects There is a growing recognition among educators and policy makers that the learning of science must dovetail with learning about science this handbook is uniquely positioned as a locus for the discussion The handbook features sections on pedagogical theoretical national and biographical research setting the literature of each tradition in its historical context It reminds readers at a crucial juncture that there has been a long and rich tradition of historical and philosophical engagements with science and mathematics teaching and that lessons can be learnt from these engagements for the resolution of current theoretical curricular and pedagogical questions that face teachers and administrators Science educators will be grateful for this unique encyclopaedic handbook Gerald Holton Physics Department Harvard University This handbook gathers the fruits of over thirty years research by a growing international and cosmopolitan community Fabio Bevilacqua Physics Department University of Pavia      [Ethics and Mathematics Education](#) Paul Ernest, 2024-06-10 This edited volume is an inquiry into the ethics of mathematics education and to a lesser extent the ethics of mathematics The imposition of mathematics for all raises questions of ethics What are the ethics of teaching school mathematics What are the costs as well as the benefits What are the ethical issues raised by the official aims of mathematics teaching the planned curriculum the pedagogies employed in school and college mathematics and the assessment systems These questions are addressed in the book as well as what systems of ethics we might use The volume ventures into a burgeoning new field It offers a unique set of investigations both theoretical and in terms of practices It announces the ethics of mathematics education as a new subfield of research and includes valuable contributions from many of the best known researchers in mathematics education additionally it is a valuable resource for students teachers and researchers in the field This is an enduring and classic source book in the field From the wisdom of leading scholars to the little heard voices of students this collection offers the reader many striking new insights into the ethics of mathematics and

education     **Education** ,1903     *Fractals, Graphics, and Mathematics Education* Michael Frame,Benoit Mandelbrot,2002-06-20 Publisher Description     **Mathematics for Social Justice** Catherine A. Buell,Bonnie Shulman,2021-11-18 Mathematics instructors are always looking for ways to engage students in meaningful and authentic tasks that utilize mathematics At the same time it is crucial for a democratic society to have a citizenry who can critically discriminate between fake and reliable news reports involving numeracy and apply numerical literacy to local and global issues This book contains examples of topics linking math and social justice and addresses both goals There is a broad range of mathematics used including statistical methods modeling calculus and basic algebra The range of social issues is also diverse including racial injustice mass incarceration income inequality and environmental justice There are lesson plans appropriate in many contexts service learning courses quantitative literacy reasoning courses introductory courses and classes for math majors What makes this book unique and timely is that the most previous curricula linking math and social justice have been treated from a humanist perspective This book is written by mathematicians for mathematics students Admittedly it can be intimidating for instructors trained in quantitative methods to venture into the arena of social dilemmas This volume provides encouragement support and a treasure trove of ideas to get you started The chapters in this book were originally published as a special issue of the journal PRIMUS Problems Resources and Issues in Mathematics Undergraduate Studies     **General Catalog - Texas Tech University** Texas Tech University,1926     **Mathematical Philosophy** Charles S. Peirce,2011-05-09 No detailed description available for Mathematical Philosophy     **Mathematical Modeling** Rutherford Aris,1999-07-16 Mathematical modeling is the art and craft of building a system of equations that is both sufficiently complex to do justice to physical reality and sufficiently simple to give real insight into the situation Mathematical Modeling A Chemical Engineer s Perspective provides an elementary introduction to the craft by one of the century s most distinguished practitioners Though the book is written from a chemical engineering viewpoint the principles and pitfalls are common to all mathematical modeling of physical systems Seventeen of the author s frequently cited papers are reprinted to illustrate applications to convective diffusion formal chemical kinetics heat and mass transfer and the philosophy of modeling An essay of acknowledgments asides and footnotes captures personal reflections on academic life and personalities Describes pitfalls as well as principles of mathematical modeling Presents twenty examples of engineering problems Features seventeen reprinted papers Presents personal reflections on some of the great natural philosophers Emphasizes modeling procedures that precede extensive calculations     *Undergraduate Catalog* University of Michigan--Dearborn,2006     **The Honourable Ladies** Iain Dale,Jacqui Smith,2019-11-14 Biteback Publishing is delighted to announce a major new project a two volume series of biographies of every female MP ever to be elected to the House of Commons When Constance Markievicz stood for election as MP for Dublin St Patrick s in 1918 few people believed she could win the seat yet she did A breakthrough in the bitter struggle for female enfranchisement had come earlier that year followed by a second landmark

piece of legislation allowing women to be elected to Parliament and Markievicz duly became the first woman MP. A member of Sinn Féin, she refused to take her seat. She did, however, pave the way for future generations and only eleven months later Nancy Astor entered the Commons. A century on from that historic event 491 women have now passed through the hallowed doors of Parliament. Each one of these pioneers has fought tenaciously to introduce enduring reform and in doing so has helped revolutionise Britain's political landscape, ensuring that women's contributions are not consigned to the history books. Containing profiles of all 287 women MPs from 1997 to 2019 and with female contributors from Mary Beard to Caroline Lucas, Ruth Davidson to Yvette Cooper and Margaret Beckett to Ann Widdecombe, *The Honourable Ladies Volume II* is an indispensable and illuminating testament to the stories and achievements of these remarkable women.

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