MATH HISTORY: POSSIBLE TOPICS FOR TERM PAPERS

Some possible seeds for “historical developmental” topics are:

- The Platonic Solids
- Solution of nth degree polynomial equation (especially quadratics)
- Difference Equations
- Changing Definition (Over Time): What is Mathematics?
- Changing Definition (Geographically): What is Mathematics?
- Fuzzy Set Theory
- Changing definition of concept of a curve
- Changing definition of concept of a function
- Changing definition of concept of continuity/limits
- Nonstandard analysis
- Lebesgue integration
- Continued fractions
- Dirichlet's problem
- Malfatti's problem
- Brachystochrome problem
- Kakeya Problem
- Mathematical Logic
- Goldbach Conjecture
- Constructions with Only a Compass
- Constructions with Only a Marked Ruler
- Rational Approximations of Roots
- Public Key Ciphers
- Meta-Mathematics
- Mersenne Primes vs. Fermat Primes
- Elliptic/Hyperbolic functions
- Fermat's Last Theorem
- Math and war
- Linear programming
- Fractional calculus
- Transcendental numbers
- Concept of irrationals
- Surreal Numbers
- Knot Theory
- Nomography
- Logarithms
- Fourier Series
- Slide Rule Mathematics
- Approximations by Power series (Taylor, Maclaurin, etc.)
- Determinants
- Matrices
- Projective geometry

- Affine geometry
- Finite geometry
- Taxicab geometry
- Different types of coordinate systems
- Differential geometry
- Riemann surfaces
- Diophantine analysis
- Indeterminate Equations
- Fourth Dimension
- Catastrophe Theory
- Topology
- Complex Numbers/Imaginaries
- Game theory
- Linear Programming
- Axiom of Choice
- Zermelo's Postulate
- Transfinite Numbers
- The infinite vs. The Infinitesimal
- Jordan Curve Theorem
- Fixed Point Theorem
- Laplace transforms
- Method of least squares
- Latin Squares
- Magic Squares and Their Extensions
- Prosthaphaeresis
- Mathematical Induction
- Number Partitions
- Agricultural Statistics
- Problem of Points and the Start of Probability
- Frequentist vs Bayesian Approaches to Probabiltiy
- Ham Sandwich Theorem
- Two-Way Interactions: Mathematics and Technology
- Famous “Unsolved” Problems and Their Resolution
- Algebraic Number Theory
- Significant Mathematics Done by Non-Mathematicians
- Mathematician _X_ and his/her Significance
- Differential Equations
- Role of Mathematical Paradoxes
- Cramer’s Rule
- Descartes’ Rule of Signs
- Idea of a Group Pervades Mathematics
- Linear Algebra is a “Part” of Abstract Algebra?
- Dedekind Cuts
- Banach-Tarski Paradox and The Axiom of Choice

- P-adic Numbers
- Role of Mathematical Societies: British, Berlin, Russian, American
- Category Theory
- Conic Sections
- Curvature
- Four-color Theorem
- Kepler's Cannon Ball Problem
- Ethnomathematics and the Culture of Mathematics
- Rule of False Position
- Greatest Mathematical Discovery of __Xth_ Century
- Blind Mathematicians
- Bishop Berkeley's Influence on Mathematics
- Kant's Influence on Geometry
- Mathematical prodigies
- Explain Cantor's "The Essence of Mathematics Lies in its Freedom"
- Mathematical Linkages
- Which Mathematicians get too Much Credit
- Which Mathematicians do not get Enough Credit
- Mathematical Duality
- Klein's Impact on the Teaching of Geometry
- Psychology of Doing/Creating Mathematics
- Famous/Significant proofs
- Deduction vs. Induction
- Harmonic Series
- Central limit theorem/Law of large numbers
- Philosophy of Mathematics
- Mathematics Impact on Philosophy
- Most Significant: e, pi, phi?
- Are the Special Numbers (e, pi, phi) invented or discovered?
- Role of Proof and Rigor in Mathematics
- Role of Notation in Development of Mathematics
- Mathematics in Art
- Mathematics in Music
- Mathematics in Literature
- Mathematics in Poetry
- Beauty as a part of Mathematics
- Leibniz's Creation of Binary System and the "Saving" of All Chinese
- NP-Problems
- Cryptology
- Mathematics in Astronomy
- Mathematics in Physics
- Mathematics in Chemistry (esp. topology)
- Mathematics in Economics
- Mathematics in Psychology

- Mathematics in the Social Sciences
- Mathematics in Geography
- Role of Mathematics in Computer Science
- Cartography
- Mathematical Dissections
- Frieze Patterns and Wallpaper Group
- Tiling of Planes and Space
- Chinese Remainder Theorem
- Spherical trigonometry
- Role of Mathematical Induction
- Role of Proof by Contradiction
- Symmetry
- Geodesy
- Napoleon's Involvement in Mathematics
- Horner's Methods
- Incommensurability
- Isoperimetric Ideas
- Geometrical Algebra vs. Algebraic Geometry
- Completeness vs Consistency
- Truth in Mathematics: Does it Exist?
- Ptolemy's Trigonometry
- History of Permutations and Combinations
- Rise and Role of Mathematical Symbolism
- Ontology Recapitulates Phylogeny: In Mathematics?
- Binomial Theorem: Proofs and Generalizations
- Examples of Mistakes by Famous Mathematicians
- Importance of Fundamental Theorems: Arithmetic, Algebra, Calculus
- Best number base…Is it e?
- Abacists vs. Algorists
- Mathematics and Religion
- Mathematical proofs of the Existence of God
- Golden Ratio
- Mobius Strip
- Famous Sequences in Mathematics
- Special Plane Curves
- Algebra in Euclid's *Elements*
- Number Theory in Euclid's *Elements*
- Theory of Proportions in Euclid's *Elements*
- Number partitions
- Means: Arithmetic, Geometric, Harmonic
- Archimedean Solids
- Viete—The First Modern Mathematician?
- What if Decimals had never been invented?
- What if zero had never been invented?

- Projective geometry vs Perspective Geometry
- Importance and Resolution of Zeno's Paradoxes
- Role of Algorithms in Mathematics
- Cavalieri's Contributions to Calculus
- Number Mysticism
- Continuum hypothesis
- Buffon's Needle Problem
- Roman Numerals and Contributions
- Proof of Non-Constructible Polygons