TRIUMPHS PSPs Available for Testing in Fall 2019

Descriptions of all PSPs available at:
http://webpages.ursinus.edu/nscoville/(Numbered)%20IUSE%20Project%20Descriptions.pdf

Complete versions of most of the PSPs listed below are available at: http://webpages.ursinus.edu/nscoville/projects.html

The *Notes to Instructors* section at the end of each PSP includes further information about its goals and design.

To obtain a preliminary copy of any PSP not yet posted on the TRIUMPHS website, contact: janet.barnett@csupueblo.edu

**** indicates a PSP that is suitable for use in History of Mathematics Courses and/or Capstone Courses for Pre-service Secondary Teachers.***

Mini-PSPs (numbers correlate with posted PSP Descriptions)	**Intended Course(s)**	**Author**
M 01. Babylonian Numeration	General Education / Elementary Education Courses *	Dominic Klyve
M 02. Regression to the Mean	Statistics	Dominic Klyve
M 03. Derivatives of The Sine and Cosine Function	Calculus I *	Dominic Klyve
M 04. Beyond Riemann Sums	Calculus I *	Dominic Klyve
M 05. The Origin of the Prime Number Theorem	Number Theory	Dominic Klyve
M 09. How to Calculate π: Machin's Inverse Tangents	Calculus 2 *	Dominic Klyve
M 10. How to calculate π: Buffon *(Two versions available, one with no calculus pre-requisite)*	Calculus 2 Precalculus / Courses for Middle School Teachers *	Dominic Klyve
M 13. Gaussian Guesswork: Elliptic Integrals and Integration by Substitution	Calculus 2	Janet Barnett
M 14. Gaussian Guesswork: Polar Coordinates, Arc Length and the Lemniscate Curve	Calculus 2	Janet Barnett
M 15. Gaussian Guesswork: Sequences & the Arithmetic-Geometric Mean	Calculus 2	Janet Barnett
M 16. The logarithm of –1	Complex Variables	Dominic Klyve
M 17. Why be so critical? Origins of Analysis in 19th Century Mathematics	Introductory Analysis *	Janet Barnett
M 18. Topology from Analysis: Making the Connection	Topology / Introductory Analysis	Nick Scoville
M 19. Connecting Connectedness	Topology	Nick Scoville
M 20. The Cantor Set before Cantor	Topology	Nick Scoville
M 21. A Compact Introduction to a Generalized Extreme Value Theorem	Topology	Nick Scoville
M 22. From Sets to Metric Spaces to Topological Spaces	Topology	Nick Scoville
M 23. The Closure Operation as the Foundation of Topology	Topology	Nick Scoville
M 24. Euler's Rediscovery of *e*	Introductory Analysis / Calculus 2	Dave Ruch
M 25. Henri Lebesgue and the Integral Concept	Introductory Analysis	Janet Barnett
M 26. Generating Pythagorean Triples via Gnomons *(Two versions available, one more open-ended)*	Number Theory / Elementary Education Courses	Janet Barnett
M 27. Seeing and Understanding Data	Statistics /General Education / Elementary Education Courses *	Beverly Wood
M 28. Euler's Calculation of the Sum of the Reciprocals of Squares	Calculus 2 *	Kenneth Monks
M 29. Braess' Paradox in City Planning: An Application of Multivariable Optimization	Multivariable Calculus	Kenneth Monks
M 30. Fermat's Method for Finding Maxima and Minima	Calculus 1	Kenneth Monks

See next page for the list of available full-length PSPs.

Full-length PSPs (numbers correlate with posted PSP Descriptions)	**Intended Course(s)**	**Author**
F 01. A Genetic Context for Understanding the Trigonometric Functions	Pre-calculus, Trigonometry*	Danny Otero
F 02. Determining the Determinant	Linear Algebra	Danny Otero
F 03. Solving a System of Linear Equations Using Elimination	Linear Algebra *	Mary Flagg
F 04. Investigating Difference Equations	Discrete Mathematics	Dave Ruch
F 05. Quantifying Certainty: the p-value	Statistics	Dominic Klyve
F 06. Pythagorean Theorem and Exigency of Parallel Postulate	Geometry *	Jerry Lodder
F 07. Failure of the Parallel Postulate	Geometry *	Jerry Lodder
F 08. Dedekind and the Creation of Ideals	Abstract Algebra	Janet Barnett
F 09. Primes, Divisibility & Factoring	Number Theory *	Dominic Klyve
F 10. The Pell Equation in Indian Mathematics	Number Theory *	Toke Knudsen & Keith Jones
F 11. Greatest Common Divisor: Algorithm and Proof	Intro. to Proof, Number Theory, Discrete Math., Abstract Algebra	Mary Flagg
F 13. Bolzano's Definition of Continuity, his Bounded Set Theorem, and an Application to Continuous Functions	Introductory Analysis	Dave Ruch
F 14. Rigorous Debates over Debatable Rigor in Analysis: Monster Functions in Introductory Analysis	Introductory Analysis	Janet Barnett
F 15. An Introduction to Algebra and Geometry in the Complex Plane	Complex Variables	Diana White & Nick Scoville
F 16. Nearness without Distance	Topology	Nick Scoville
F 17. Connectedness - Its Evolution and Applications	Topology	Nick Scoville
F 18. Construction of Figurate Numbers	General Education *	Jerry Lodder
F 19. Pascal's Triangle and Mathematical Induction	General Education *	Jerry Lodder
F 20. Investigations Into d'Alembert's Definition of Limit	Introductory Analysis	Dave Ruch
F 21. An Introduction to a Rigorous Definition of Derivative	Introductory Analysis	Dave Ruch
F 23. The Mean Value Theorem	Introductory Analysis	Dave Ruch
F 24. Abel and Cauchy on a Rigorous Approach to Infinite Series	Introductory Analysis	Dave Ruch
F 25. The Definite Integrals of Cauchy and Riemann	Introductory Analysis	Dave Ruch
F 26. Gaussian Integers and Dedekind Ideals: A Number Theory Project	Number Theory *	Janet Barnett
F 27. Otto Hölder's Formal Christening of the Quotient Group Concept	Abstract Algebra	Janet Barnett
F 28. Roots of Early Group Theory in the Works of Lagrange	Abstract Algebra *	Janet Barnett
F 29. Radius of Curvature According to Christiaan Huygens	Vector Calculus	Jerry Lodder
F 31. Cross Cultural Comparisons: The Art of Computing the Greatest Common Divisor	Elementary Education Courses	Mary Flagg
F 32. A Look at Desargues' Theorem from Dual Perspectives	Geometry / Introduction to Proof	Carl Lienert
F 33. Completing the Square: From the Beginning of Algebra	Pre-calculus *	Danny Otero
F 34. Argand's Development of the Complex Plane	Complex Variables *	Diana White & Nick Scoville

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