

MA445: Senior Seminar in Mathematics

Baker University — Spring 2023

Course Outline

Each of the following readings comes from the textbook *The History of Mathematics: an Introduction* (Seventh Edition) by David M. Burton.

Calculus: Wallis to Kovalevsky

- Wallis's *Arithmetica Infinitorum* (pages 383-386)
- Newton's Golden Years (last sentence of page 393 to second paragraph of page 396)
- The Early Work of Leibniz (last paragraph of page 411 to the section's end on page 413)
- Leibniz's Creation of the Calculus (page 413 to the second paragraph of page 415 as well as the last paragraph of the section on page 416)
- Newton's Fluxional Calculus (page 416 to the second paragraph of page 418)
- Maria Agnesi and Emilie du Châtelet (page 430 to the third paragraph of page 432)
- MacLaurin's *Treatise on Fluxions* (second paragraph of page 525 to the second paragraph of page 526 as well as the last three paragraphs of the section on page 527)
- Euler's Life and Contributions (last paragraph page 530 to second paragraph page 534)
- D'Alembert and Cauchy on Limits (second paragraph page 607 to section's end page 610)
- Sonya Kovalevsky (entire section, page 616 to page 619)

Number Theory: Fermat to Noether

- Mathematical Induction (page 461 to the section's end on page 463)
- Francesco Maurolico's Use of Induction (second paragraph of page 464 to the first paragraph on page 465)
- Fermat's *Arithmetica* (last paragraph of page 513 to the section's end on page 516)
- The Famous Last Theorem of Fermat (page 516 to the second paragraph of page 517)
- Euler's Life and Contributions (second paragraph of page 535 to the end of page 536)
- Gauss's *Disquisitiones Arithmeticae* (first two paragraphs of page 546)

- Cantor's Theory of Infinite Sets (last paragraph of page 677 to section's end on page 681)
- India's Prodigy, Ramanujan (page 728 to section's end on page 729)
- Emmy Noether's Theory of Rings (first paragraph of the section on pages 735 and 736 as well as the last paragraph on page 737 to the first paragraph on page 739)

Probability: Pascal to Kolmogorov

- De Méré's Problem of Points (first paragraph on page 454 as well as the last paragraph of page 454 to the section's end on page 456)
- The Traité du Triangle Arithmétique (first paragraph of the section on page 456 as well as the first paragraph on page 459 to the section's end on page 461)
- Francesco Maurolico's Use of Induction (first paragraph page 465 to section end page 466)
- Laplace's Research in Probability Theory (first paragraph of the section on page 483 as well as the last paragraph of page 484 to the second paragraph of page 487 as well as the second paragraph of page 488 to the section's end on page 489)
- Mary Fairfax Somerville (page 482 to section's end on page 483)
- Daniel Bernoulli, Poisson, and Chebyshev (page 489 to the first paragraph on page 491 as well as the last three paragraphs of the section on pages 492 and 493)