

Exam 3 Information

Math 208 GH – Spring 2017

Exam 3 will cover the following topics (All Lecture Notes posted with Classes 1-31)

Are you ready for calculus 2?	Graphing the Reciprocal
Overview of Conic Sections	Integrating Hyperbolic Functions
Review of Trigonometric Functions	Volumes 4 (cylindrical shell method)
Differentiating Trig Functions	Work
Inverse Trig Expressions	Arc Length
The Fundamental Theorem	Center of Mass
Exponents and Logarithms	The Real Number System
Basic Integration Formulas	The Least Upper Bound Property
Differentiation (practice)	Proving the Intermediate Value Theorem
Integrating by Substitution	Sequences - Part 1
Trigonometric Integrals 1	Sequences - Part 2
Sum-Product Identities	Sequences - Part 3
Integration by Parts	Arithmetic Sequences
Trigonometric Formulas	Geometric Sequences
Trigonometric Substitutions	Sequences - Part 4
Partial Fractions	Limits of Sequences
l'Hôpital's Rule	Geometric series
Integrals (Practice)	Fractions and decimals
Improper Integrals	Series 1
Riemann Sums	Series 2 (comparison test)
Numerical Integration	Series 3 (ratio and root tests)
Applications of the Definite Integral - 1	Series 4 (alternating series)
Volumes 1 (cross sections)	Power Series
Volumes 2 (disk method)	Taylor Series
Hyperbolic Functions	
Volumes 3 (washer method)	

Students are expected to derive formulas such as

derivatives and antiderivatives of functions such as $\ln x$, exponential functions, trigonometric and inverse trigonometric functions, hyperbolic and inverse hyperbolic functions; volume formulas using integrals; limits of sequences,

Students are expected to correctly state

The Intermediate Value Theorem, The Fundamental Theorem of Calculus (both parts), the definition of $f(x)=\ln x$ as a function defined in terms of definite integrals; the least upper bound property, definition of limit of a sequence, definition of a series; definitions of absolute convergence, conditional convergence and divergence of series; the comparison test, ratio test, root test, integral test, alternative series test, and the n th term test; definition of a power series, famous convergent power series and their radius of convergence, definition of Taylor polynomial of order n for a function f

Students are expected to prove

- 1) $\ln(x)+\ln(y)=\ln(xy)$ where $\ln x$ is defined in terms of definite integrals
- 2) The Intermediate Value Theorem (first version)
- 3) A bounded non-decreasing sequence is convergent.
- 4) A convergent sequence is bounded.
- 5) The limit of a sequence is unique.
- 6) The constant multiplier rule for sequences:
- 7) The sum rule for limits of sequences;
- 8) The comparison test;
- 9) The ratio test;
- 10) If a series converges absolutely, then it converges.

Topics from the Textbook

- Chapter 5 – all
- Chapter 6 – all
- Chapter 7 – all except 7.6
- Chapter 8 – 8.1, 8.3
- Chapter 11 – all
- Appendix D, E, F, G

Last revised: May 2, 2017