CALCULUS III
FALL 2019

TOPICS FOR REVIEW[1]

Algebra/Precalculus

- Graphs of elementary functions:
  - Polynomials and rational functions
  - Trigonometric functions (sine, cosine, tangent, etc.)
  - The exponential function and the natural logarithm (e^x and $\ln x$)
- Equations and graphs of conic sections:
  - Parabolas
  - Ellipses and Circles
  - Hyperbolas
- Special values of sine and cosine:
  - Multiples of $\pi/6$
  - Multiples of $\pi/4$
- Trigonometric identities:
  - Fundamental identity
  - Sum formulae
  - Half-angle formulae
- Solving systems of equations in several variables (elimination/substitution)

[1] While mastery of these topics is essential for success in Calculus III, this list is not intended to be comprehensive.

Calculus I

- Derivatives:
  - Limit definition of $f'(x)$
  - Interpretations of $f'(x)$
  - Differentiation rules: linearity, product rule, quotient rule, chain rule
  - Derivatives of elementary functions
  - Implicit differentiation
  - Optimization (maximum and minimum values)

- Definite Integrals:
  - Riemann sums
  - Limit definition of $\int_a^b f(x)\,dx$
  - Geometric interpretation of $\int_a^b f(x)\,dx$
  - FTOC

Calculus II

- Antidifferentiation (a.k.a. integration) techniques:
  - Substitution
  - (Repeated) Integration by parts
  - Trig. integrals (e.g. integrals of the form $\int \sin^m x \, \cos^n x \, dx$)