Math 21C-2
Review Sheet

- Sequences

    Definition

    Convergence, Limits, Divergence to Infinity

    [1] Definition of Convergence

    Calculation of Limits

    Nondecreasing Sequence Theorem

- Series

    Definition of nth Term, Partial Sum, Convergence

    Geometric Series

    Techniques for Checking Convergence

    nth Term Test for Divergence

    Integral Test

    Comparison, Limit Comparison Tests

    Ratio and Root Tests

    Alternating Series

    Definitions of Absolute/Conditional Convergence

    Power Series

    Definition, Radius of Convergence, Interval of Convergence

    Term-by-term Differentiation/Integration

    Taylor and Maclaurin Series

    Definition

    Calculation of Taylor series

    Taylor Polynomials

    [1] Remainder Estimation Theorem

- Vectors

  Rectangular coordinates

  Distance formula

  Component form for vectors

  Magnitude

    Unit Vectors

  Vector Addition, Subtraction, Scalar Multiplication

  Standard Unit Vectors $\vec{\imath}$, $\vec{\jmath}$, $\vec{k}$

  Dot Product

    Calculation

    Angle Formula

    Orthogonality

    Projection

  Cross Product

    Definition

    Calculation

    Geometric Interpretation

  Equations of Lines in Space

  Equations of Planes in Space

  [1] Distances from Points to Lines/Planes

- Vector-Valued Functions

  Geometric Interpretation

  Limits and Continuity of vector-valued functions

  Derivatives and Integrals of vector-valued functions

    Position, velocity, acceleration

  [1] Ideal Projectile Motion Equation

  [1] Arc Length

  [1] Unit Tangent Vector

  [1] Curvature, Principal Unit Normal Vector

- Partial Derivatives

    Functions of several variables

        Domain, range

    Interior Points, Boundary Points, Open, Closed

    Bounded, Unbounded

    Level Curves, Level Surfaces

    Graph

    Limits of Functions of Several Variables

        [1] Definition

        Calculation of Limits

        Continuous Functions of Several Variables

    Definition of Partial Derivatives

    Calculation of Partial Derivatives

        Chain Rule

        Mixed Partial Derivatives

    Directional Derivatives

        Definition

        Calculations

    Gradient

        Calculation

        Geometric and Functional Interpretation

    [1] Tangent Planes

    [1] Differentials and Linearizations

    Extreme Values and Saddle Points

        Definitions

        First Derivative Test

        Second Derivative Test

        Calculation of Local and Absolute Extrema

Method of Lagrange Multipliers

Calculations with One Constraint

Calculations with Two Constraints

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[1]These topics will not be expressly covered on the Final Exam. Though, knowing them may be helpful.

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