Cheatography

Calculus 2 - Final Exam Cheat Sheet

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II. Basic Techniques of Integration

(i) Completing the Square

(ii) Polynomial Division

(iii) Separating Numerators

III. Basic Integration Rules

IV. Integration by Parts

(i) Choosing u dan dv (LIATE)

(ii) Repeated Iterations

(iii) Cycling

V. Trig Integrals

(i) Pythagorean Identities

(ii) Half Angle and Double Angle Identities

(iii) Basic Trig Definitions

(iv) sin(u) cos(u) Integral Techniques

(v) sec(u) tan(u) Integral Techniques

I. Limits Review

(i) L'Hopitals Rule

VI. Trig Substitution

(i) Standard Substitutions

(ii) Reference Triangles

(iii) Converting Answers Back in Terms of x

VII. Partial Fractions

(i) Simple Roots

(ii) Repeated Roots

(iii) Factors without Roots

(iv) Solving for Unknown Constants (a) Setting Coefficients Equal (b) Plugging in x-Values

(v) Integration of Partial Fraction Decompositions

VIII. Trapezoidal Rule

(i) Error Estimate for Trapezoidal Rule

IX. Simpson's Rule

(i) Error Estimate for Simpson's Rule

X. Improper Integrals

(i) Infinite Limits of Integration

(ii) Integrands with Vertical Asymptotes

XIV. Series

(i) Convergence and Divergence

(ii) Sequence of Terms {an}

(iii) Sequence of Partial Sums {sn}

(iv) Harmonic Series

(v) Re-Indexing a Series

(vi) Absolute Convergence

(vii) Conditional Convergence

XV. Convergence Tests for Series

(i) Partial Sums

(ii) Nth Term Test/ Divergence Test

(iii) Geometric Series Test

(iv) Geometric Series Sum Formula

(v) P-Series Test

(vi) Integral Test

(vii) Remainder Theorem for the Integral Test

(viii) Direct Comparison Test

(ix) Limit Comparison Test

(x) Alternating Series Test

(xi) Remainder Estimation Theorem for the Alternating Series Test

(xii) Ratio Test

(xiii) Root Test

XIII. Sequences

XII. Limit Comparison Test for Integrals

XI. Direct Comparison Test for Integrals

XVI. Power Series

(i) Interval of Convergence

(ii) Radius of Convergence

(iii) Ratio Test and Other Series Tests to Check Endpoints

XVII. Power Series Operations

(i) Composition of a Power Series with a Continuous Function

(ii) Term by Term Differentiation

(iii) Term by Term Integration

XVIII. Taylor and Maclaurin Series

XIX. Taylor Polynomials of Order n

(i) Approximating Function Values Using Taylor Polynomials

(ii) Degree vs. Order of a Taylor Polynomial

XX. Taylor's Theorem

XXI. Taylor's Formula

XXII. Remainder of Order n

XXIII. Remainder Estimation Theorem

XXV. Parametric Equations

(i) Traveling Particle

(ii) Cartesian Equations vs. Parametric Equations and Converting

(iii) Domains for the Parameter

(iv) Parametric Equations for Lines

(v) Parametric Equations for Circles

(vi) the Natural Parameterization

XXVI. Arc Length of Curves

XXVII. Polar Coordinates

(i) Plotting Points in Polar Coordinates

(ii) Converting Between Rectangular and Polar Coordinates

(i) Convergence of a Sequence
(ii) Monotone Sequences
(iii) Bounded Sequences
(iv) Monotone Sequence Theorem/ Monotone Convergence Theorem
(i) Finding an Upper Bound M for the Appropriate Derivative of f(x)
(ii) Finding the Maximum Possible Error of a Taylor Polynomial Approximation
(iii) Finding the x-Values Where an Approximation will be within a Particular Error Tolerance
XXIV. List of Important Taylor Series to Memorize
(i) Developing new Taylor Series using substitution
(ii) Multiplying Taylor Series by constants and powers of x

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