



Calculus 2

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Section 1 - Integrals

- Antiderivatives
- Antiderivatives and Integration
- Notation for Integration
- The Power Rule
- Integratable Form
- Indefinite and Definite Integrals
- Evaluating Definite Integrals
- Riemann Sums
- Integrals and Riemann Sums
- The Fundamental Theorem of Calculus

Section 2 - Integration Techniques

- Integration by U-Substitution
- The Reverse Chain Rule
- Integration by Parts
- Integration by Parts for Definite Integrals
- Integration using Partial Fractions
- Integrating the Sine and Cosine Functions
- Integrating the Tangent Function
- Improper Integrals
- Evaluating Improper Integrals of the Form $[a, \infty)$
- Evaluating Improper Integrals of the Form $(-\infty, \infty)$
- Evaluating Improper Integrals - Discontinuous at 'a' or 'b'
- Improper Integrals – Discontinuous in the interval (a, b)



Section 3 – Application of Integrals

Finding the Area Under a Curve
Finding the Area Between Two Curves
Volumes of Revolution
Volumes of Revolution Around the X-Axis
Volumes of Revolution Around the Y-Axis
Arc Length Using Integration
Evaluating Arc Length Using Integration

Section 4 – Parametric Functions

Parametric Functions
Writing Parametric Functions in Cartesian Form
Differentiating Parametric Functions
Second Derivatives for Parametric Functions
Curves of Parametric Functions
Tangent Lines to Parametric Curves
The Area Under a Parametric Curve
The Arc Length of a Parametric Curve
Volumes of Revolution for Parametric Curves
Surface Area of Revolution for Parametric Curves

Section 5 – Polar Functions

Polar Coordinates
Switching Between Polar and Cartesian Coordinates
Graph Sketching for Polar Curves
Tangent Lines to Polar Curves
The Intersection of Polar Curves
The Area Bounded by a Polar Curve
The Area Between Two Polar Curves
The Arc Length of a Polar Curve
The Surface Area of Revolution of a Polar Curve

Section 6 – Sequences

Determining the General Term of a Sequence
The Convergence of a Sequence
The Limit of a Convergent Sequence
Types of Sequence
Bounded Sequences



Section 7 – Series

Partial Sums of an Infinite Series
Sum of an Infinite Series Using Partial Sums
Geometric Series Convergence Test
The Sum of a Geometric Series
Repeating Decimal Problems
Telescoping Series
The Sum of a Convergent Telescoping Series
The Limit and Sum of an Infinite Series
Common Series Results

Section 8 – Series Convergence Tests

The Integral Convergence Test
The P-Series Test
The Nth Term Test
The Direct Comparison Test
The Limit Comparison Test
The Ratio Test
The Root Test
Alternating Series Test
Alternating Series Estimates
Absolute and Conditional Convergence

Section 9 – Power Series

Power Series, Taylor Series and Maclaurin Series
Interval and Radius of Convergence
Multiplying Power Series
Dividing Power Series
Differentiating Power Series
Evaluating Indefinite Integrals for Power Series
Evaluating Definite Integrals for Power Series
Starting Taylor Series
The Radius and Interval of Convergence of a Taylor Series
Taylor's Inequality
Starting Maclaurin Series
Evaluating the Sum of a Maclaurin Series
The Radius and Interval of Convergence of a Maclaurin Series
Writing Indefinite Integrals as an Infinite Series
Approximating Definite Integrals Using an Infinite Series