
Contents

Ch. 1	Calculus and Basic Algebra	1
1.1	Limits and Continuity	1
1.1.1	Definition of a Limit	1
1.1.2	Theorem: Intermediate Value Theorem	1
1.1.3	Example: Calculating Limits	1
1.1.4	Proposition: Continuity Implies Limit	2
1.2	Differentiation	2
1.2.1	Definition: Derivative	2
1.2.2	Theorem: Power Rule for Derivatives	2
1.2.3	Corollary: Special Case of Power Rule	2
1.2.4	Exercise: Differentiation Practice	2
1.2.5	Python Code Snippet: Differentiation	3
1.2.6	Example: Derivative Calculation	3
1.3	Applications of Derivatives	3
1.3.1	Theorem: Critical Points and Extrema	3
1.4	Algebraic Functions and Equations	4
1.4.1	Axiom: Properties of Real Numbers	4
1.4.2	Proposition: Solving Quadratic Equations	4
1.4.3	Example: Solving Quadratic Equations	4
1.4.4	Python Code Snippet: Quadratic Solver	4
1.5	Trigonometric Limits	5
1.5.1	Theorem: Sine Limit	5
1.5.2	C++ Code Snippet: Calculating Sine Limit	5
Ch. 2	Introduction to Algorithms	6
2.1	Basics of Algorithms	6
2.1.1	Definition of an Algorithm	6
2.1.2	Theorem: Big-O Notation	6
2.1.3	Example: Time Complexity of Linear Search	6
2.1.4	Exercise: Analyze Linear Search	7