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Nota di contenuto	Mathematical Methods for Finance; Contents; Preface; About the Authors; CHAPTER 1 Basic Concepts: Sets, Functions, and Variables; INTRODUCTION; SETS AND SET OPERATIONS; Proper Subsets; Empty Sets; Union of Sets; Intersection of Sets; Elementary Properties of Sets; DISTANCES AND QUANTITIES; n-tuples; Distance; Density of Points; FUNCTIONS; VARIABLES; KEY POINTS; CHAPTER 2 Differential Calculus; INTRODUCTION; LIMITS; CONTINUITY; TOTAL VARIATION; THE NOTION OF DIFFERENTIATION; COMMONLY USED RULES FOR COMPUTING DERIVATIVES; HIGHER-ORDER DERIVATIVES; Application to Bond Analysis Application of the Chain RuleTAYLOR SERIES EXPANSION; Application to Bond Analysis; CALCULUS IN MORE THAN ONE VARIABLE; KEY POINTS; CHAPTER 3 Integral Calculus; INTRODUCTION; RIEMANN INTEGRALS; Properties of Riemann Integrals; LEBESGUE-STIELTJES INTEGRALS; INDEFINITE AND IMPROPER INTEGRALS; THE FUNDAMENTAL THEOREM OF CALCULUS; INTEGRAL TRANSFORMS; Laplace Transforms; Fourier Transforms; CALCULUS IN MORE THAN ONE VARIABLE; KEY POINTS;

CHAPTER 4 Matrix Algebra; INTRODUCTION; VECTORS AND MATRICES DEFINED; Vectors; Matrices; SQUARE MATRICES; Diagonals and Antidiagonals; Identity Matrix  
Diagonal Matrix Upper and Lower Triangular Matrix; DETERMINANTS; SYSTEMS OF LINEAR EQUATIONS; LINEAR INDEPENDENCE AND RANK; HANKEL MATRIX; VECTOR AND MATRIX OPERATIONS; Vector Operations; Matrix Operations; FINANCE APPLICATION; EIGENVALUES AND EIGENVECTORS; DIAGONALIZATION AND SIMILARITY; SINGULAR VALUE DECOMPOSITION; KEY POINTS; CHAPTER 5 Probability: Basic Concepts; INTRODUCTION; REPRESENTING UNCERTAINTY WITH MATHEMATICS; PROBABILITY IN A NUTSHELL; OUTCOMES AND EVENTS; PROBABILITY; MEASURE; RANDOM VARIABLES; INTEGRALS; DISTRIBUTIONS AND DISTRIBUTION FUNCTIONS; RANDOM VECTORS STOCHASTIC PROCESSES PROBABILISTIC REPRESENTATION OF FINANCIAL MARKETS; INFORMATION STRUCTURES; FILTRATION; KEY POINTS; CHAPTER 6 Probability: Random Variables and Expectations; INTRODUCTION; CONDITIONAL PROBABILITY AND CONDITIONAL EXPECTATION; MOMENTS AND CORRELATION; COPULA FUNCTIONS; SEQUENCES OF RANDOM VARIABLES; INDEPENDENT AND IDENTICALLY DISTRIBUTED SEQUENCES; SUM OF VARIABLES; GAUSSIAN VARIABLES; APPROXIMATING THE TAILS OF A PROBABILITY DISTRIBUTION: CORNISH-FISHER EXPANSION AND HERMITE POLYNOMIALS; Cornish-Fisher Expansion; Hermite Polynomials  
Cornish-Fisher Expansion with Hermite Polynomials THE REGRESSION FUNCTION; Linear Regression; FAT TAILS AND STABLE LAWS; Fat Tails; The Class L of Fat-Tailed Distributions; The Law of Large Numbers and the Central Limit Theorem; Stable Distributions; KEY POINTS; CHAPTER 7 Optimization; INTRODUCTION; MAXIMA AND MINIMA; LAGRANGE MULTIPLIERS; NUMERICAL ALGORITHMS; Linear Programming; Quadratic Programming; CALCULUS OF VARIATIONS AND OPTIMAL CONTROL THEORY; STOCHASTIC PROGRAMMING; APPLICATION TO BOND PORTFOLIO: LIABILITY-FUNDING STRATEGIES; Cash Flow Matching; Portfolio Immunization  
Scenario Optimization

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### Sommario/riassunto

The mathematical and statistical tools needed in the rapidly growing quantitative finance field. With the rapid growth in quantitative finance, practitioners must achieve a high level of proficiency in math and statistics. Mathematical Methods and Statistical Tools for Finance, part of the Frank J. Fabozzi Series, has been created with this in mind. Designed to provide the tools needed to apply finance theory to real world financial markets, this book offers a wealth of insights and guidance in practical applications. It contains applications that are broader in scope from wha

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