

Contents

Chapter 1	REVIEW	1
	1.1 Exponents	1
	1.2 Polynomials	2
	1.3 Factoring	3
	1.4 Fractions	3
	1.5 Radicals	4
	1.6 Order of Mathematical Operations	5
	1.7 Use of a Pocket Calculator	5
<hr/>		
Chapter 2	EQUATIONS AND GRAPHS	27
	2.1 Equations	27
	2.2 Cartesian Coordinate System	28
	2.3 Linear Equations and Graphs	28
	2.4 Slopes	29
	2.5 Intercepts	30
	2.6 The Slope-Intercept Form	30
	2.7 Determining the Equation of a Straight-Line	32
	2.8 Applications of Linear Equations in Business and Economics	33
<hr/>		
Chapter 3	FUNCTIONS	56
	3.1 Concepts and Definitions	56
	3.2 Graphing Functions	57
	3.3 The Algebra of Functions	58
	3.4 Applications of Linear Functions for Business and Economics	59
	3.5 Solving Quadratic Equations	60
	3.6 Facilitating Nonlinear Graphing	60
	3.7 Applications of Nonlinear Functions in Business and Economics	61
<hr/>		
Chapter 4	SYSTEMS OF EQUATIONS	89
	4.1 Introduction	89
	4.2 Graphical Solutions	89
	4.3 Supply-and-Demand Analysis	90
	4.4 Break-Even Analysis	92
	4.5 Elimination and Substitution Methods	93
	4.6 Income Determination Models	95
	4.7 IS-LM Analysis	96
	4.8 Economic and Mathematical Modeling (Optional)	97
	4.9 Implicit Functions and Inverse Functions (Optional)	97
<hr/>		
Chapter 5	LINEAR (OR MATRIX) ALGEBRA	128
	5.1 Introduction	128
	5.2 Definitions and Terms	128
	5.3 Addition and Subtraction of Matrices	129

	5.4	Scalar Multiplication	130
	5.5	Vector Multiplication	130
	5.6	Multiplication of Matrices	130
	5.7	Matrix Expression of a System of Linear Equations	132
	5.8	Augmented Matrix	133
	5.9	Row Operations	134
	5.10	Gaussian Method of Solving Linear Equations	134
<hr/>			
Chapter 6		SOLVING LINEAR EQUATIONS WITH MATRIX ALGEBRA	151
	6.1	Determinants and Linear Independence	151
	6.2	Third-Order Determinants	151
	6.3	Cramer's Rule for Solving Linear Equations	152
	6.4	Inverse Matrices	154
	6.5	Gaussian Method of Finding an Inverse Matrix	155
	6.6	Solving Linear Equations with an Inverse Matrix	156
	6.7	Business and Economic Applications	157
	6.8	Special Determinants	158
<hr/>			
Chapter 7		LINEAR PROGRAMMING: USING GRAPHS	177
	7.1	Use of Graphs	177
	7.2	Maximization Using Graphs	177
	7.3	The Extreme-Point Theorem	178
	7.4	Minimization Using Graphs	178
	7.5	Slack and Surplus Variables	180
	7.6	The Basis Theorem	180
<hr/>			
Chapter 8		LINEAR PROGRAMMING: THE SIMPLEX ALGORITHM AND THE DUAL	197
	8.1	The Simplex Algorithm	197
	8.2	Maximization	197
	8.3	Marginal Value or Shadow Pricing	200
	8.4	Minimization	200
	8.5	The Dual	200
	8.6	Rules of Transformation to Obtain the Dual	201
	8.7	The Dual Theorems	202
	8.8	Shadow Prices in the Dual	203
	8.9	Integer Programming	203
	8.10	Zero-One Programming	205
<hr/>			
Chapter 9		DIFFERENTIAL CALCULUS: THE DERIVATIVE AND THE RULES OF DIFFERENTIATION	219
	9.1	Limits	219
	9.2	Continuity	220
	9.3	The Slope of a Curvilinear Function	221
	9.4	The Derivative	223
	9.5	Differentiability and Continuity	223
	9.6	Derivative Notation	223
	9.7	Rules of Differentiation	224
	9.8	Higher-Order Derivatives	227
	9.9	Implicit Functions	227

Chapter 10	DIFFERENTIAL CALCULUS: USES OF THE DERIVATIVE	246
	10.1 Increasing and Decreasing Functions	246
	10.2 Concavity and Convexity	246
	10.3 Relative Extrema	246
	10.4 Inflection Points	248
	10.5 Curve Sketching	248
	10.6 Optimization of Functions	249
	10.7 The Successive-Derivative Test	251
	10.8 Marginal Concepts in Economics	251
	10.9 Optimizing Economic Functions for Business	251
	10.10 Relationship Among Total, Marginal, and Average Functions	252
<hr/>		
Chapter 11	EXPONENTIAL AND LOGARITHMIC FUNCTIONS	276
	11.1 Exponential Functions	276
	11.2 Logarithmic Functions	276
	11.3 Properties of Exponents and Logarithms	279
	11.4 Natural Exponential and Logarithmic Functions	279
	11.5 Solving Natural Exponential and Logarithmic Functions	280
	11.6 Logarithmic Transformation of Nonlinear Functions	281
	11.7 Derivatives of Natural Exponential and Logarithmic Functions	281
	11.8 Interest Compounding	282
	11.9 Estimating Growth Rates from Data Points	283
<hr/>		
Chapter 12	INTEGRAL CALCULUS	304
	12.1 Integration	304
	12.2 Rules for Indefinite Integrals	304
	12.3 Area under a Curve	306
	12.4 The Definite Integral	307
	12.5 The Fundamental Theorem of Calculus	307
	12.6 Properties of Definite Integrals	308
	12.7 Area between Curves	309
	12.8 Integration by Substitution	310
	12.9 Integration by Parts	311
	12.10 Present Value of a Cash Flow	312
	12.11 Consumers' and Producers' Surplus	313
<hr/>		
Chapter 13	CALCULUS OF MULTIVARIABLE FUNCTIONS	335
	13.1 Functions of Several Independent Variables	335
	13.2 Partial Derivatives	335
	13.3 Rules of Partial Differentiation	336
	13.4 Second-Order Partial Derivatives	338
	13.5 Optimization of Multivariable Functions	339
	13.6 Constrained Optimization with Lagrange Multipliers	341
	13.7 Income Determination Multipliers	342
	13.8 Optimizing Multivariable Functions in Business and Economics	343
	13.9 Constrained Optimization of Multivariable Economic Functions	344
	13.10 Constrained Optimization of Cobb-Douglas Production Functions	344
	13.11 Implicit and Inverse Function Rules (Optional)	345
<hr/>		
	INDEX	377