

Contents

	Page
Chapter 1 Functions	
1 Definition of a Function (of one variable)	1
1.1 Definition	1
1.2 Domain of a Function	1
1.3 Composition of Functions	2
2 The Graph of a Function	3
3 Linear Functions	5
3.1 The Slope of a Line	5
3.2 Horizontal and Vertical Lines	6
3.3 The Slope-Intercept Form	6
3.4 The Point-Slope Form	6
4 Functional Models	8
4.1 A Profit Function	8
4.2 Functions Involving Multiple Formulas	8
4.3 Break-Even Analysis	9
4.4 Market Equilibrium	11
Chapter Exercises	12
Chapter 2 Differentiation: Basic Concepts	
1 The Derivative	
Definition	19
2 Techniques of Differentiation	20
2.1 The Power Rule	20
2.2 The Derivative of a constant	21
2.3 The Constant Multiple Rule	21
2.4 The Sum Rule	21
2.5 The Product Rule	21
2.6 The Derivative of a Quotient	21
3 The Derivative as a Rate of change	22
3.1 Average and Instantaneous Rate of Change	22
3.2 Percentage Rate of Change	23
4 Approximation by Differentials; Marginal Analysis	23
4.1 Approximation of Percentage change	24
4.2 Marginal Analysis in Economics	25
4.3 Differentials	27
5 The Chain Rule	27
6 Higher-Order Derivatives	29
6.1 The Second Derivative	29
6.2 The n^{th} Derivative	30

7	Concavity and the Second Derivative Test.....	30
8	Applications to Business and Economics	34
8.1	Elasticity of Demand.....	34
8.2	Levels of Elasticity of Demand.....	36
8.3	Elasticity and the Total Revenue	36
	Chapter Exercises.....	38
Chapter 3 Functions of Two Variables		
1	Functions of Two Variables.....	49
2	Partial Derivatives.....	50
2.1	Computation of Partial Derivatives	50
2.2	Second-Order Partial Derivatives	52
3	The Chain Rule; Approximation by the Total Differential.....	53
3.1	Chain Rule for Partial Derivatives.....	53
3.2	The Total differential	55
3.3	Approximation of Percentage Change	56
4	Relative Maxima and Minima	56
5	Lagrange Multipliers.....	59
5.1	Constrained Optimization Problems.....	59
5.2	The Lagrange Multiplier	61
	Chapter Exercises.....	62
Chapter 4 Linear Programming (LP)		
1	System of Linear Inequalities in Two Variables.....	72
1.1	Graphing a Linear Inequality in Two Variables	72
1.2	Solving Systems of Linear Inequalities	73
2	Geometric Linear Programming	74
	Chapter Exercises.....	77
	Bibliography	81