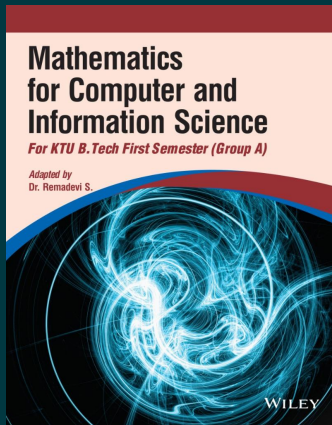




Mathematics for Computer and Information Science For KTU B. Tech Semester 1 (Group A)

By Erwin Kreyszig, Howard Anton, Dr. Remadevi S.

Paperback

9789363860421

₹493.00

Pages: 356

Description

This book is a refined adaptation of the best-selling titles Advanced Engineering Mathematics by Erwin Kreyszig and Calculus: Early Transcendentals, 12th Edition by Howard Anton. Renowned for its expository style and clarity of presentation, this text offers an elementary exploration of the subject, addressing the evolving needs of today's students. Our aim is to elucidate the fundamentals of subject in the most comprehensible way, with pedagogy as our primary focus. It covers topics of:

- Continuity and Derivatives
- Functions of Several Variables and Partial Derivatives
- Directional Derivatives, Gradient and Local Extreme Values
- Constrained Maxima and Minima and Linear Programming

About the Author

Erwin Kreyszig, Howard Anton, Dr. Remadevi S.

Erwin Kreyszig , Professor of Mathematics, Ohio State University ,Columbus, Ohio

Herbert Kreyszig, Carleton University , Associate Professor of Mathematics

Edward J. Normination , Associate Professor of Mathematics, Carleton University, Ottawa, Ontario

Howard Anton, Drexel University

Irl Bivens, Davidson College

Stephen Davis , Davidson College

Adapted for KTU by

Dr. Remadevi. S, Retd. Professor and Head of Department of Applied Science, Govt. Model Engineering College, Thrikkakara, Cochin, Kerala

Table of Contents

1. LIMITS, CONTINUITY AND DERIVATIVES

1.1 Limit of a Function Values

Sampling Pitfalls

One-Sided Limits

The Relationship Between One-Sided Limits and Two-Sided Limits

Computing Limits

Limits of Polynomials and Rational Functions as $x \rightarrow a$

Limits Involving Radicals

Limits of Piecewise-Defined Functions

The sandwich Theorem [Squeeze Principle]

Solved Examples

Quick Check Problem 1.1

Problem Set 1.1

Answer Key

1.2 Continuity

Definition of Continuity

Continuity in Applications

Continuity on an Interval

Some Properties of Continuous Functions

Continuity of Polynomials and Rational Functions

Continuity of Compositions

Continuity of Inverse Functions

The Intermediate-Value Theorem

Approximating Roots Using the Intermediate-Value Theorem

Continuity of Trigonometric Functions

Obtaining Limits by Squeezing

Solved Examples

Quick Check Problem 1.2

Problem Set 1.2

Answer Key

1.3 Tangent Lines and Rates of Change

Tangent Lines

Velocity

Slopes and Rates of Change

Rates of Change in Applications

Quick Check Problem 1.3

Problem Set 1.3

Answer Key

1.4 The Derivative Function

Definition of the Derivative Function

Computing Instantaneous Velocity

Differentiability

The Relationship Between Differentiability and Continuity

Derivatives at the Endpoints of an Interval

Other Derivative Notations

Geometrical Interpretation of Derivative

Solved Examples

Quick Check Problem 1.4

Problem Set 1.4

Answer Key

1.5 Differentiation Rules

Derivative of a Constant

Derivatives of Power Functions

Derivative of a Constant Times a Function

Derivatives of Sums and Differences

Higher Derivatives

The Product and Quotient Rules

Derivative of a Quotient

Summary of Differentiation Rules

Quick Check Problem 1.5

Problem Set 1.5

Answer Key

Obtaining Limits by Squeezing

Solved Examples

Quick Check Problem 1.2

Problem Set 1.2

Answer Key

1.3 Tangent Lines and Rates of Change

Tangent Lines

Velocity

Slopes and Rates of Change

Rates of Change in Applications

Quick Check Problem 1.3

Problem Set 1.3

Answer Key

1.4 The Derivative Function

Definition of the Derivative Function

Computing Instantaneous Velocity

Differentiability

The Relationship Between Differentiability and Continuity

Derivatives at the Endpoints of an Interval

Other Derivative Notations

Geometrical Interpretation of Derivative

Solved Examples

Quick Check Problem 1.4

Problem Set 1.4

Answer Key

1.5 Differentiation Rules

Derivative of a Constant

Derivatives of Power Functions

Derivative of a Constant Times a Function

Derivatives of Sums and Differences

Higher Derivatives

The Product and Quotient Rules

Derivative of a Quotient

Summary of Differentiation Rules

Quick Check Problem 1.5

Problem Set 1.5

Answer Key

1.6 Instantaneous Rates of Change

Motion on a Straight Line – Displacement Velocity, Speed and Acceleration

Definition Velocity (Instantaneous Velocity)

Derivatives in Economics

Problem Set 1.6

Answer Key

1.7 The Chain Rule

Derivatives of Compositions

An Alternative Version of the Chain Rule

Generalized Derivative Formulas

Differentiating Using Computer Algebra Systems

Quick Check Problem 1.7

Problem Set 1.7

Answer Key

1.8 Implicit Differentiation

Functions Defined Explicitly and Implicitly

Implicit Differentiation

Necessary Conditions for Implicit Differentiation

Tangent and Normal Lines

Quick Check Problem 1.8

Problem Set 1.8

Answer Key

1.9 Local Linear Approximation; Differentials

Error in Local Linear Approximations

Differentials

Local Linear Approximation from the Differential Point of View

Error Propagation

More Notation; Differential Formulas

Quick Check Problem 1.9

Problem Set 1.9

Answer Key

1.10 Analysis of Functions: Increase, Decrease and Concavity

Increasing and Decreasing Functions

Concavity

Inflection Points

Inflection Points in Applications

Logistic Curves

Quick Check Problem 1.10

Problem Set 1.10

Answer Key

2. FUNCTIONS OF SEVERAL VARIABLES AND PARTIAL DERIVATIVES

2.1 Functions of Two or More Variables

Notation and Terminology

Functions Described by Tables

Graphs of Functions of Two Variables

Level Curves

Contour Plots Using Technology

Level Surfaces

Graphing Functions of Two Variables Using Technology

Quick Check Problem 2.1

Problem Set 2.1

Answer Key

2.2 Limits and Continuity

Limits Along Curves

Open and Closed Sets

General Limits of Functions of Two Variables

Relationships Between General Limits and Limits Along Smooth Curves

Repeated Limits

Algebra of Limits

Continuity

Limits at Discontinuities

Continuity at Boundary Points

Extensions to Three Variables

Solved Examples

Quick Check Problem 2.2

Problem Set 2.2

Answer Key

2.3 Partial Derivatives

Partial Derivatives of Functions of Two Variables

The Partial Derivative Functions

Partial Derivative Notation

Partial Derivatives Viewed as Rates of Change and Slopes

Estimating Partial Derivatives from Tabular Data

Implicit Partial Differentiation

Partial Derivatives and Continuity

Partial Derivatives of Functions with More Than Two Variables

Higher-order Partial Derivatives

Equality of Mixed Partial

The Wave Equation

Differentiability

Differentiability and Continuity

Differentials

Solved Examples

Quick Check Problem 2.3

Problem Set 2.3

Answer Key

2.4 The Chain Rule

Chain Rules for Derivatives

Chain Rules for Partial Derivatives

Other Versions of the Chain Rule

Implicit Differentiation

Solved Examples

Quick Check Problem 2.4

Problem Set 2.4

Answer Key

3. Directional Derivatives, Gradient and Local Extreme Values

3.1 Directional Derivatives and Gradients

Directional Derivatives

The Gradient

Properties of the Gradient

Gradients are Normal to Level Curves

An Application of Gradients

Properties of the Directional Derivative

Solved Examples

Quick Check Problem 3.1

Problem Set 3.1

Answer Key

3.2 Maxima and Minima of Functions of Two Variables

Extrema

Bounded Sets

The Extreme-value Theorem

Finding Relative Extrema

The Second Partial Test

Finding Absolute Extrema on Closed and Bounded Sets

Solved Examples

Quick Check Problem 3.2

Problem Set 3.2

Answer Key

4. Constrained Maxima and Minima and Linear Programming

4.1 Lagrange Multipliers

Extremum Problems with Constraints

Lagrange Multipliers

Three Variables and One Constraint

Lagrange's Multipliers with Two Constraints

Quick Check Problem 4.1

Problem Set 4.1

Answer Key

4.2 Basic Concepts. Unconstrained Optimization: Method of Steepest Descent

Quick Check Problem 4.2

Problem Set 4.2

Answer Key

4.3 Linear Programming Formulation

General LPP

Normal Form of a Linear Programming Problem

Formation of LPP

Graphical Solution Method

Problem Set 4.3

Answer Key

To purchase this product, please visit:

<https://www.wileyindia.com/mathematics-for-computer-and-information-science-for-ktu-b-tech-semester-1-group-a.html>



Scan to buy