

VOLUME I
UNIVERSITY MATHEMATICS

REVISED AND EXPANDED EDITION

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First edition 2019
Second edition 2025

ISBN: 978-978-977-880-5

Published by
5-Profz International
Km. 42 Lekki-Epe Expressway, Lekki, Lagos.
 +2348127455000

*Dedicated to students, chasing knowledge with might,
Whether undergraduate, postgraduate, or professional,
This book, a beacon through your scholarly days and nights,
Guiding, inspiring, as you reach academic heights.*

PREFACE

Dear Student,

Bravo! Welcome to this epic book, *University Mathematics*, where numbers weave the fabric of understanding, and equations unlock the mysteries of the universe. The book has been meticulously re-crafted to support you in navigating the multifaceted terrain of higher mathematics, as it provides you a solid foundation for both academic inquiry and real-world applications. With its broad structure, the book is tailored to offer clear, insightful explanations of key mathematical principles, along with practical exercises to deepen your understanding and sharpen your problem-solving skills.

Each chapter is structured to provide a clear and concise overview of the key concepts, with numerous examples and exercises to cultivate mastery. In the early chapters, you will explore business mathematics topics, including set theory, logic, algebra, equations and series, building a solid foundation for the more advanced topics that follow. You will then delve deeper into operations research topics such as capital budgeting, inventory control, decision and network analysis as well as queuing theory.

The latter half of the book covers a range of topics in statistics and data analysis, including probability, hypothesis testing, regression and time series. These chapters are meticulously designed to help you apply your statistical knowledge to real-world data, and to develop the critical thinking skills required for success in both academia and industry.

I hope that this book will serve as a valuable resource throughout your university studies, and that it will inspire you to explore the many fascinating and rewarding applications of mathematics in the world around us. Whether you are a beginner or an advanced student, I believe that this book will equip you with the tools and knowledge you need to succeed in your academic journey and beyond.

Thanks for choosing *University Mathematics* – and best of luck!

Olaniyi Evans, Ph.D.

ACKNOWLEDGEMENTS

To the dedicated reviewers of this book, my immense gratitude for your meticulous scrutiny, constructive critiques and insightful feedback. To my colleagues and students, I am profoundly grateful for your unwavering support and continuous encouragement. To *Ayomi Ini-K*, *Olami Oba-X* and *Iremi Teni-D*, I love you to the moon & back.

CONTENTS

0. Mathematical Preliminaries	1
Number Systems	1
Integers	2
Multiplying/Dividing with Negatives	2
Order of Operations: PEMDAS	2
Fractions	3
Proportions, Percents, Rates, and Ratios	4
Percents to Decimals and Decimals to Percents	4
Scientific Notation	5
Algebraic Terms	5
Metric Conversions	5
Approximations	5
Percentage Error & Degree of Accuracy	6
Modular Arithmetic	6
Changing the Subject of a Formula	7
Distance Formula	7
Functions & Relations	7
Perimeter & Area	8
Volume & Surface Area	8
Polygons	8
Variation	9
1. Set Theory	10
Sets	10
Set Operations	11
Fundamental Laws of Set Algebra	12
Venn Diagrams	13
Word Problems on Sets and Venn Diagrams	14
2. Logic	19
Propositional Logic	19
Truth Table	20
Connectives and Operations between Propositions	20
Types of Statements	21
Inverse, Converse, and Contrapositive	22
Universal and existential quantifiers	22
Negation of Propositions	22
Methods of Proofs	23
Duality Principle	23
3. Algebra, Factorization & Surds	26
Algebra	26
Factorization	28
Surds	29
4. Indices, Logarithms & Growth	31
Indices	31
Logarithms	32
Exponential Equations	34
Logarithmic Equations	35
Mathematics of Growth Rates	36

5. Linear Equations & Inequalities	38
Solving Linear Equations	38
Graphing Linear Equations	40
Word Problems with Linear equations	41
Linear Inequalities	43
Inequalities on a Number Line	44
Graphing Inequalities	44
Absolute Value Inequalities	44
Word Problems with Inequalities	45
6. Quadratic Equations	47
Standard Form	47
Factoring	48
Completing the Square	48
Quadratic Formula	49
Graphing Quadratic Functions	51
The Discriminant	52
Word Problems to Quadratic Equations	54
7. Simultaneous Equations	58
System of Equations in 2 Variables	58
Elimination Method	58
Substitution Method	59
Graphical Method	60
Linear-Quadratic System of Equations	62
System of Equations in 3 Variables	64
Word Problems on Simultaneous Equations	66
8. Functions & Applications	70
Functions	70
Identities	70
Types of Functions	70
Economic Functions	71
Supply & Demand Analysis	74
IS-LM Analysis	74
Income Determination Models	75
9. Sequences & Series	77
Sequences	77
Arithmetic Progression	77
Geometric Progression	79
Sum of an Infinite Geometric Series	81
Sigma Notation of a Series	82
10. Permutation & Combination	85
Factorial	85
Counting Principles	85
Permutations	86
I. Permutations when repetition is allowed	86
II. Permutations of n different objects	87
III. Permutation where some items are identical	87
Combinations	88
Combination with Repetition	89
Combinations without Repetition	89

11. Index Numbers	92
Simple Price Index	92
Aggregate Price Indices	93
Weighted Aggregate Price Indices	94
Consumer Price Index (CPI) and Inflation	96
Stock Exchange Index	98
Indices of Development	99
Human Development Index (HDI)	100
Multidimensional Poverty Index	101
Base Shifting (or Rebasing) of Index Numbers	103
Deflating the Index Numbers	103
Criteria of a Good Index Number	103
12. Simple & Compound Interest: Annuities & Perpetuities	
Simple Interest	105
Compound Interest	106
Continuous Compounding	108
Annuities	110
Deferred Annuity	113
Perpetuity	113
13. Trade & Cash Discount: Markup & Markdown	116
Discount	116
Discount Series	117
Cash Discount	118
Ordinary Dating Method	118
End of Month Dating Method	118
Receipt of Goods Dating Method	119
Partial Payments	119
Markup	120
Rate of Markup	121
Markdown	121
14. Capital Budgeting Techniques	124
Discounted Cash Flow Technique	124
Classification of Investment Projects	124
Payback Period	125
Discounted Payback Period	126
Net Present Value	127
Internal Rate Of Return	128
Modified Internal Rate of Return (MIRR)	131
Profitability Index (PI)	133
15. Sensitivity Analysis	135
16. Project Selection under Capital Rationing	141
Capital Rationing	141
Single-period capital rationing	142
Single Period Capital Rationing with Divisible Projects	142
Single Period Capital Rationing with Indivisible Projects	143
Multi-Period Capital Rationing	144
17. Decision Analysis & Trees: Risk & Uncertainty	148
Decision Analysis	148
Decision-Making Criteria Under Uncertainty	149
Decision-Making Under Risk	150
Decision Trees	153

18. Transportation & Assignment Models	159
Nature of a Transportation Model	159
Solution of Transportation Problems	159
Special Issues in Modeling	165
Assignment Model	166
19. Inventory Planning & Production Control	170
Inventory	170
Inventory Costs	170
Inventory Re-order Level	171
General Inventory Models	172
EOQ with Gradual Replenishment (Stockholder Manufacturer)	173
EOQ with Stock-outs	174
EOQ with Bulk Discounts	174
Probabilistic Inventory Models and Safety Stock	175
20. Network Analysis	178
Network Diagram	179
Critical Path Method	179
Project Scheduling	180
Program Evaluation and Review Technique (PERT)	183
Cost Scheduling	186
Gantt Chart	190
Linear Programming in Project Scheduling	191
21. Simulation Modeling	193
Modeling in Problem Solving	193
Basic Steps in Simulation	194
Types of Systems in Simulation Models	194
Simulation Methods	195
Monte Carlo Method	196
22. Queueing Theory & Models	201
Elements of a Queueing System	201
Types of Service Order/Queueing Disciplines	201
Important distributions in Queueing Theory	202
Types of Queueing Models	202
Kendall's Notation	202
Single Server (M/M/1)	203
Multiple Server (M/M/k)	204
23. Replacement Analysis	207
Replacement of Items that Deteriorate	207
Replacement of Items that Fail Suddenly	210
Individual Replacement Policy	210
Group Replacement Policy	211
24. Descriptive Statistics	215
Measures of Location	215
Mean, Median & Mode	216
Percentiles	216
Quartiles	217
Measures of Variability, or Dispersion	219
Range	219
Interquartile Range	219

Variance and Standard Deviation	220
Coefficient of Variation	220
Measures of Association	221
Covariance	221
Correlation Coefficient	221
Grouped Data	223
25. Probabilities	225
Basic Relationships of Probability	228
Complement	228
Union and Intersection	228
Mutually Exclusive Events	228
Addition Law	228
Conditional Probability	230
Multiplication Law	230
Tree Diagrams	233
Bayes' Theorem	235
26. Discrete & Continuous Probability	240
Random Variables: Probability Distributions	240
Discrete Probability Distributions	240
Binomial Probability Distribution	242
Binomial Experiment	243
Binomial Probability Function	243
Poisson Probability Distribution	245
Continuous Probability Distributions	247
Normal Probability Distribution	247
Normal Curve	247
27. Hypothesis Testing	249
z-Tests: Large Sample Tests	250
t-Tests: Small Sample Tests	252
Chi-Square Tests	254
Chi-Square Test of Goodness of Fit	254
Chi-Square Test of Independence	256
F-Tests: One-Way ANOVA	257
28. Regression & Correlation	262
Regression	262
Simple Regression	262
Coefficient of Determination	264
Correlation Coefficient	265
Multiple Regression	267
29. Time Series & Forecasting	271
Forecasting	271
Time Series Patterns	271
Smoothing Methods	273
Moving Averages	274
Weighted Moving Average	275
Exponential Smoothing	275
Forecast Accuracy	276
Trend Projection	277
Linear Regression Analysis	277
Nonlinear Trend Regression	279
Seasonality and Trend	280

30. Mathematical Induction	284
31. Coordinate Geometry	287
Distance Between Two Points	287
Mid-Point of a Line Segment	287
Gradient/Equation of a Straight Line	288
Parallel Lines	289
Perpendicular Lines	290
32. Complex Numbers	293
Arithmetic Operations with Complex Numbers	293
Distance in the Complex Plane	295
Midpoint in the Complex Plane	295
Argand Diagrams	296
Polar Form	296
Exponential Form	296
33. Trigonometric Functions	298
Triangle	298
Pythagorean Theorem	298
Trigonometric Identities	301
Scalene Triangles	303
Law of Sines/Cosines	304
Bearings	305
Elevation and Depression	307
34. Vectors	310
Vector Addition	310
Cartesian Components of a Vector	310
The Scalar Product of Two Vectors	311
Position Vectors & Direction Vectors	312
Collinearity (lying on a straight line)	313
Perpendicular Vectors	313
Vector Equation of a Line	314
Parallel & Skews Lines	314
Cross Product of Two Vectors	316
35. Data Analysis: Excel & SPSS	318
Types of Data	318
Excel	319
Excel Formulas	322
SPSS	323
SPSS Commands	325
36. Econometric Analysis: Eviews & Stata	327
Eviews	327
Eviews Commands	330
Stata	332
Stata Commands	335
Econometric Techniques for Time Series and Panel Data	338
<i>Suggestions for Further Reading</i>	343
<i>Index</i>	344
<i>Tables</i>	347



TOPICS IN VOLUME II

1. Calculus: Differentiation
2. Applications of Differential Calculus
3. Differentiation of Logarithmic & Trigonometric Functions
4. Multivariate Functions & Partial Derivatives
5. Further Applications of Multivariate Calculus
6. Limits, Continuity & Differentiability
7. Polynomials: Remainder & Factor Theorem
8. Partial Fractions & Binomial Series
9. Calculus: Integration
10. Calculus: Definite Integrals
11. Matrices & Determinants
12. Matrices & Simultaneous Equations
13. Quadratic Forms, Definite Matrices, Eigenvalues & Hessian
14. Input-Output Analysis
15. Partial & General Equilibrium Analysis
16. Linear Programming
17. Linear Programming: Simplex Method
18. Duality in Linear Programming
19. Game Theory
20. Non-linear Programming & Envelope Theorem
21. Differential Equations
22. Difference Equations
23. Differential & Difference Equations of Higher Order
24. Simultaneous Systems of Differential & Difference Equations
25. Optimal Control Theory

MATH STRATEGY AND STUDY TIPS

- 1. Practice Like a Pro!** Consistent practice is your gateway to mathematical mastery. Solve new problems daily to keep your mind sharp and agile!
"*Ama* solves 10 math problems every morning to stay sharp and focused for her exams."
- 2. Unlock Your Toolbox!** Leverage every resource—textbooks, formula sheets, calculators, and online tools. Different perspectives unlock deeper understanding.
"*Oba* often watches math tutorials on YouTube to gain fresh insights and better understand complex concepts."
- 3. Learn from Mistakes!** Mistakes are your greatest teachers. Review your errors, identify gaps, and turn weaknesses into strengths.
"*Ola* always reviews his math mistakes daily to pinpoint gaps and grow more confident in his problem-solving abilities."
- 4. Uncover the Why!** Understanding the principles behind the formulas is key. Grasping the 'why' makes formulas more intuitive and powerful.
"*Ola* always asks his teacher to explain the logic behind formulas, and it helps everything click into place."
- 5. Complete Homework!** Homework is your training ground. Each problem solved strengthens your grasp on theoretical concepts, bringing them to life.
"Every week, *Sage* completes his math homework with a study partner, and they quiz each other to reinforce what they've learned."
- 6. Break Down Problems!** Conquer complex problems by breaking them into smaller, manageable steps. Tackling them one piece at a time makes them less intimidating.
"*Chi* always breaks down challenging math problems into smaller steps, which makes solving them more straightforward."
- 7. Seek Help When Needed!** Learning is a collective journey. Don't hesitate to reach out to instructors, peers, or tutors for guidance.
"*Chi* often joins study groups to clarify doubts and gain fresh perspectives from her classmates."
- 8. Prepare Strategically!** Review thoroughly, practice relentlessly, and approach tests methodically. Build math confidence every day.
"*Ama* always reviews her notes and tackles practice tests to ensure she's fully prepared and confident for her exams."

Remember, every problem you solve is a step toward mastery. Stay persistent, stay curious!

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