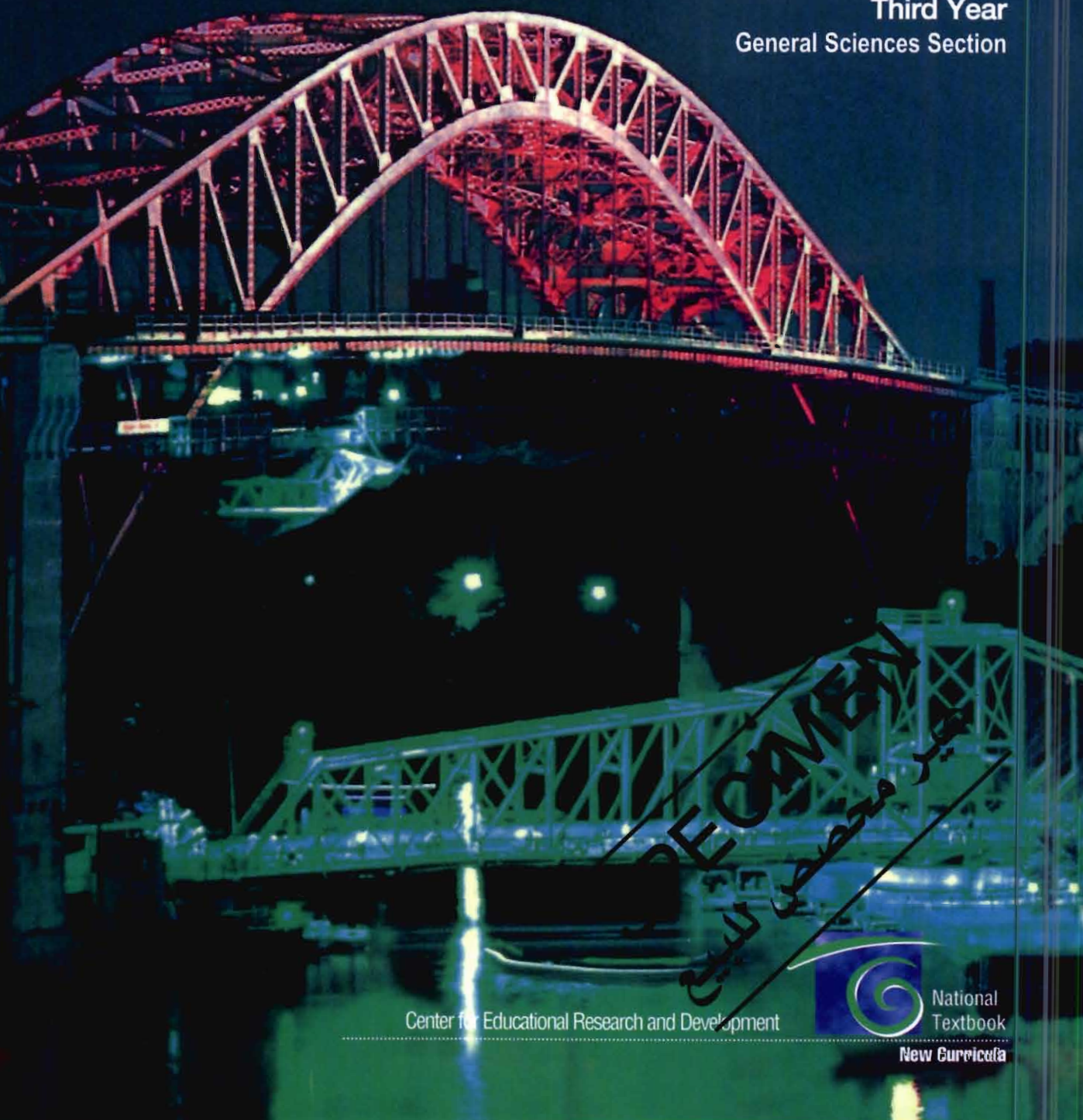
building up MATHEMATICS

Calculus and Statistics

Secondary Education
Third Year
General Sciences Section



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غير متحصل عليه

Center for Educational Research and Development
National Textbook
New Curricula

Republic of Lebanon
Ministry of National Education, Youth and Sports

BUILDING UP MATHEMATICS

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National Textbook
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The National Textbook Project

By issuing the textbooks for the third year of each educational cycle, the Educational Center for Research and Development will have completed the third and last installment of books called for by the New Curricula. We are placing these books in the hands of students with the great hope that we are moving, step by step, toward the goal of acquiring sound learning, using sophisticated educational means and up-to-date methodology that encourage and reinforce individual thinking and research, acquisition of skills, development of ethical and national attitudes, the feeling of national belonging as well as the feeling of belonging to humanity at large.

The on-going revolution in information, communication and educational-aids technology has undoubtedly limited the role of the textbook and lowered the rank it used so recently to occupy. However, in our society and in many other societies, the textbook remains the basic means of education, and it is our duty to exert our utmost effort and care to come up with the best product as to form and content. Yet we should not lose sight of the fact that the textbook is not sufficient by itself but should rather be used as a stepping stone to access other sources of information. What is important is to keep a clear vision and maintain the right course toward our objective. The means should not turn into the end and the student should always remain the focus of the learning/teaching process.

No one ignores or denies the fact that textbook writing requires very high academic and educational qualifications and very wide field experience. The authors committees undeniably possess such qualities. Yet the textbooks of the last two years contained some negative aspects. Such is the nature of human work, no matter how good the intentions or how great the effort extended. Here constructive criticism constitutes a real contribution to raising the standard of authorship, minimizing errors and filling gaps. We say that, with all due appreciation and respect to all those who have contributed to the success of this project.

The Educational Center for Research and Development is embarking this year on a process of evaluating the New Curricula and related textbooks, teacher training courses and student achievement. This is a natural and necessary step now that the new system has been put into effect. This process aims at identifying the curricular objectives that have been achieved as well as those that have not been achieved, with a view to proceeding with the positive aspects and correcting the negative ones.

As part of this correction process, we plan to review the versions that have been issued in order to secure good textbooks for our students, who always deserve the best.

March 13, 2000

President, Educational Center for Research and Development

Nemer FRAYHA

PREFACE

The "**Building up Mathematics**" collection was created and edited in compliance with the demands of the new program. Here we find: the scientific content, unambiguously detailed and defined; the targeted objectives, controlled and evaluated; and the explicity shown method recommended.

Far from being a dry account of facts, this work is a tool that permits and promotes the active participation of learners. We wanted to create an instructive product suitable for an education based on the balanced and well-defined division of labor between three parties: **the student - the instructor - the administrator**.

The instructor is not only the possessor of knowledge but is more the leader of the class; he/she guides it in its choice of orientations, maintains its interest, promotes research among its members, and helps find results while indicating their applications.

At the heart of the educative system is the student, a person with the right to an education worthy of a free individual, independent and seeking knowledge. It is the student who, without feeling forced to put up with the knowledge he/she must learn, should feel constantly faced with situations that stimulate his/her desire to know more.

- In what concerns new notions (such as parametric curves) that assume that the student has a high level of maturity, the appeal will be to his/her intuition and not to his/her reasoning.
- Pleasant and easy proofs were kept in the text while those that seemed to us complicated and difficult were omitted. Our objective was to introduce the student to reasoning and to prepare him/her to tackle the exercises at the end of the chapter with ease.
- The "Just for Fun" heading closes each chapter of the book. This will be the focus of a weekly session reserved for independent mathematical research with a theme (that the teacher will choose or modify according to the level of the class). Some may think that this approach is " not classical" and so oppose it by naming it a "waste of time." We reply, however, that the benefits of such research by far compensate for the relative length of time allocated to it.

Finally, any remarks, criticisms, or suggestions that colleagues would like to make will be received with attention.

The authors

Table of Contents

			Pages
Introduction			
Chapter 1	:	Irrational functions.	11
Chapter 2	:	Parametric curves.	17
Chapter 3	:	Continuous functions on an interval.	29
Chapter 4	:	Inverse functions.	41
Chapter 5	:	Inverse trigonometric functions.	49
Chapter 6	:	Differential calculus.	57
Chapter 7	:	Natural Logarithm.	67
Chapter 8	:	Exponential functions.	77
Chapter 9	:	Power functions.	87
Chapter 10	:	Second and higher order derivatives.	97
Chapter 11	:	Sequences.	107
Chapter 12	:	Circular functions.	117
Chapter 13	:	Measures of central tendency.	125
Chapter 14	:	Measures of dispersion.	135
Chapter 15	:	Integral.	143
Chapter 16	:	Properties of the integral.	155
Chapter 17	:	Integration techniques.	165
Chapter 18	:	Mean value of a function.	177
Chapter 19	:	Applications to integration.	185
Chapter 20	:	First order differential equations.	193
Chapter 21	:	Linear second order differential equations with constant coefficients.	203
Chapter 22	:	Combinations.	211
Chapter 23	:	Conditional probability.	221
Chapter 24	:	Random variables.	229
Chapter 25	:	Self Evaluation - Answers and Hints.	239