University of the West Indies
Summer School 2014
Department of Economics
EC08A: Remedial Mathematics

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Course Objective

This course seeks:

To provide students with an opportunity to review those aspects of elementary mathematics that are essential foundations for the study of introductory calculus, economics and statistics;

To enable students to overcome weaknesses in their previous mathematical training, in particular to help them to develop an understanding of the extent to which the different aspects of mathematics are interrelated.

The focus is therefore on mathematical concepts and their interrelationship and not on the computational skills and the use of algorithms.

Prerequisites: CXC general proficiency grades IV to VI (III to V pre 1998) or CXC basic proficiency grade I or have equivalent mathematical training.

Recommended Texts

Students should refer to the relevant sections of any available text for the CXC examination or its equivalent. Included among these are:

Althea Foster and Terry Tomlinson, *Mathematics for Caribbean Schools*, Longmans Caribbean, San Juan, Trinidad and Tobago, Second Edition

Alex Greer and Clarrie Layne, *Certificate Mathematics, A Revision Course for the Caribbean*, Stanley Thornes, Cheltenham

Raymond Toolsie, *Mathematics, A Complete Course with CXC Questions*, Caribbean Educational Publishers, San Fernando

Course Assessment

Mid-Semester Exam: 35%
In-Class Quizzes: 15% (5 Quizzes will be given)
Final Exam: 50 %

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Course Outline

1. Numbers
* The real numbers
* Operations with zero and negative numbers
* Use of symbols to represent numbers
* Operations using algebraic numbers
2. Algebra
- Expansion, simplification and factorization
- Changing the subject of a formula
- Solving linear equations (with one variable number)
- Solving linear inequalities (with one variable number)
- Solving simultaneous linear equations (with two variable numbers)
- Word problems for linear equations, linear inequalities and simultaneous linear equations
- Part 2) Solving quadratic equations by factorization and the quadratic formula
- Solving a pair of equations (with two variable numbers) where one equation is quadratic and the other linear
- Expressing numbers in exponential and logarithmic forms
- Transposition between the logarithmic and exponential forms
- Solving simple exponential equations
- Solving simple logarithmic equations (without tables or calculators)
3. Sets
- Use of set language
- Defining a set
- The null or empty set
- The universal set
- Subsets
- Set operations: union and intersection
- The complement of a set, relative complement
- Venn Diagrams
4. Geometry
* Nature of simple geometric figures
* Area of simple figures
- Area of sectors and segments of circles
- Pythagoras\' Theorem (no proof)
5. Relations and functions
- Relations
- Functions
- Ordered pairs
- Domain and range of a function
- Functional notation
- Examples of functions including constant, linear, quadratic, simple hyperbola, log and exponential functions

6. Graphs

- The Cartesian coordinate system
- The axes as real lines
- Plotting of graphs
- Representing inequalities on a number line
- General form of the quadratic function
- Graph of the quadratic function
- Roots of a quadratic function (graphical solution)
- Maximum and minimum values of a quadratic function

7. Matrices

- Use of matrices to represent information
- Types of matrices
- Matrix operations and their properties
- Determinant of 2 x 2 matrices
- Singular 2 x 2 matrices
- Inverse of a non-singular 2 x 2 matrix
- Solution of simple problems in algebra using matrices

* For sections marked with an asterisk see Problem Set 0. It is assumed that students are already familiar with these ideas.