Requirements from mathematics for entrance examinations

at the Faculty of Economics Matej Bel University,

Banská Bystrica, Slovak Republic

I. NUMBER SETS

1.1. Definition of a set. Basic operations with sets.
A subset of a set, the union and the intersection of two sets. Venn diagrams.

1.2. Basic number sets.
The set of natural numbers, the set of integers, the set of rational numbers, irrational numbers, the set of real numbers. The absolute value of a real number. The set of complex numbers. Basic operations with complex numbers.

II. FUNCTION OF ONE VARIABLE

2.1. Definition of a function, the domain and the range of a function, the graph of a function, one-to-one function, the inverse of a function, a composite function, a periodic function, an even and an odd function, a monotone function.

2.2. Elementary functions.
A linear function, a quadratic function, a polynomial function, a rational function, exponential and logarithmic functions, trigonometric functions (sin x, cos x, tan x, cotan x), inverse trigonometric functions (arcsin x, arccos x, arctan x, arccotan x).

III. EQUATIONS AND INEQUATIONS

3.1. Linear equations and systems of linear equations.
3.2. Linear inequations and systems of linear inequations.
3.3. Quadratic equations and inequations.
3.4. Equations and inequations with unknown in absolute value.
3.5. Equations and inequations with parameter.
3.6. Irrational equations and inequations.
3.7. Exponential equations and inequations.
3.8. Logarithmic equations and inequations.

IV. SEQUENCES

4.1. Arithmetic sequence.
4.2. Geometric sequence.

V. COMBINATORICS

5.1. Combinations.
5.2. Variations.
5.3. Permutations.
5.4. Binomial theorem.

VI. ANALYTIC GEOMETRY

6.1. A straight line.
Straight lines in two-dimensional and three-dimensional Euclidean space.
6.2. A plane.
6.3. Relations between straight lines and planes.
6.4. A circle, an ellipse, a parabola, a hyperbola.