

# Charles University Faculty of Medicine Hradec Kralove

---



UNIVERZITA KARLOVA

## Syllabus:

**Mathematics Entrance Test**

## Source:

[http://www.lf3.cuni.cz/3LFEN-13-version1-sylabus\\_mathematics.pdf](http://www.lf3.cuni.cz/3LFEN-13-version1-sylabus_mathematics.pdf)

## **ALGEBRA**

- Modification of algebraic expressions. Multiplying, adding and subtracting algebraic expressions. Expanding brackets.
- Simplifying, adding and subtracting fractions.
- The basic formulas for counting with powers and roots. Logarithms.
- The factorizations of algebraic expressions.
- Goniometrical functions and formulas.
- Inverse functions.
- The rules for calculating with complex numbers.

## **FUNCTIONS**

- Basic properties of elementary functions.
- Graphs of elementary functions. Domain and range. Even, odd, inverse, periodic, increasing, decreasing and bounded function. Maximum and minimum of the function.

## **SEQUENCES AND SERIES**

- Arithmetical and geometrical sequence.
- Sum of a geometric series.

## **EQUATIONS AND INEQUALITIES**

- Basic types of equations and inequalities. In particular: linear, quadratic, irrational, logarithmic, exponential and goniometrical equations, resp. inequalities.
- Solving equations (and inequalities) in one variable.
- Solving equations (and inequalities) involving absolute value.
- Solving of a system of equations in many variables.

## **COMBINATORICS AND PROBABILITY**

- Combinations, variations, permutations.
- Randomness and probability.
- Mutually exclusive, collectively exhaustive, complementary and independent events.
- Probability of more events (all happen, either of them happens).

## **GEOMETRY I**

- Plane and solid geometry. Geometrical shapes in plane and space.
- Perimeters, areas and volumes of basic formations in the plane and in the space.

## **GEOMETRY II**

- Analytic geometry in the plane and in the space. Vector.
- Analytical equations of conic sections, lines and planes. Intersection.
- Line joining two points. Length, midpoint and gradient.
- Scalar and vector product.