

# Regulations for the Mathematics Entrance Examination for Foreign Candidates Applying for First-Cycle Degree Programmes Offered at Lublin University of Technology

## 1. General provisions

1. The organizer of the mathematics entrance examination (hereinafter referred to as the “examination”) is Lublin University of Technology, which is responsible for the conduct of the examination and substantive supervision.
2. The examination is conducted by a committee composed of two employees — academic teachers of Lublin University of Technology.
3. The examination is conducted remotely via the MS Teams platform, in English.
4. A condition for being admitted to the examination is the completion of all formalities related to registration in the recruitment system, including payment of the recruitment fee.
5. The purpose of the examination is to verify the mathematics knowledge of foreign candidates applying for English-language degree programmes at Lublin University of Technology.
6. The examination schedule, access details for the MS Teams platform, and the invitation to take the examination are provided to candidates in advance and are carried out according to Polish local time.
7. During the examination, it is mandatory to have the webcam turned on and directed at the examinee.
8. During the examination, the candidate may use only a sheet of paper for notes and a pen or pencil.
9. The scope of knowledge required for the examination is specified in Appendix No. 1 to these regulations.

## 2. Verification of the identity of a candidate applying for studies

1. Identity verification is mandatory for all candidates.
2. Verification is carried out by a member of the examination committee on the basis of a passport shown to the camera (the page with the photograph).
3. Verification is conducted before the start of the main part of the examination and includes the candidate presenting identification to the camera and confirmation that the candidate is alone in the room where they will take the examination.

## 3. Conduct of the examination

1. Candidates receive access details (login, password, link/team code) for the MS Teams platform and the examination via the email address provided during registration in the Electronic Candidate Registration System (ERK).
2. The examination is available only within a specified time period — failure to take the examination within this period is considered resignation from the recruitment process.
3. It is not permitted to log in to the examination multiple times.
4. The examination is time-limited — candidates have 60 minutes to complete it.
5. The maximum number of points that can be obtained is 20.
6. In order to obtain a positive examination result, the candidate must score at least 30% of the total points. Failure to obtain a positive result means the end of the recruitment process with a negative result and results in the issuance of a decision refusing admission to studies.

## 4. Technical and room requirements

1. The technical requirements necessary to participate in the examination are as follows:
  - 1.1. a stable internet connection,
  - 1.2. a working microphone and camera,
  - 1.3. the current version of the MS Teams application installed on the device or access to the service through an internet browser.
2. The room in which the candidate stays during the examination must meet the following requirements:
  - 2.1. it must ensure privacy (open spaces and transparent walls are not allowed),
  - 2.2. it must have one door that can be closed and that is visible on the webcam during the examination,
  - 2.3. during the examination, only the examinee may be present in the room.

## 5. Final provisions

1. Failure to comply with the above rules results in the invalidation of the examination and the end of the recruitment process with a negative result.
2. These regulations are sent to candidates in an email informing them about the date and course of the examination.
3. The organizer reserves the right to amend these regulations.
4. The candidate has the right to appeal against the examination result in writing within 3 working days. The repeated decision of the committee is final and not subject to further appeal.

**Scope of knowledge for the mathematics entrance examination for foreign candidates applying for first-cycle degree programmes offered at Lublin University of Technology**

**Real numbers:**

- powers and roots,
- logarithms,
- percentage calculations.

**Algebraic expressions:**

- addition and multiplication of algebraic sums,
- algebraic identities.

**Sets and absolute value:**

- intervals of numbers — union, difference, and intersection of intervals,
- calculating the value of expressions involving absolute value,
- linear equations with absolute value.

**Equations and inequalities:**

- linear equations,
- quadratic equations,
- linear inequalities,
- quadratic inequalities.

**Systems of linear equations:**

- identifying systems of linear equations (consistent independent, consistent dependent, inconsistent),
- solving systems of linear equations by the substitution method,
- solving systems of linear equations by the elimination method,
- geometric interpretation of a system of equations.

**Functions:**

- reading the properties of a function from its graph (domain, range, zeros, intervals of monotonicity, minimum and maximum value of a function),
- a point belonging to the graph of a function,
- shifting function graphs along the OX and OY axes.

**Linear function:**

- slope-intercept form and general form of a linear function,
- slope and intercept of a linear function,
- the equation of a line passing through two points,
- zero of a linear function,
- identifying parallel and perpendicular lines on the basis of graphs.

**Quadratic function:**

- general form, vertex form, and factored form of a quadratic function,
- graph of a quadratic function,
- axis of symmetry of a parabola,
- intervals of monotonicity of a quadratic function,
- range of a quadratic function,
- number of zeros of a quadratic function,
- minimum and maximum value of a quadratic function on a closed interval.

**Polynomials and rational expressions:**

- degree of a polynomial, root of a polynomial, factored form of a polynomial,
- addition, subtraction, and multiplication of polynomials,
- domain of a rational expression,
- multiplication and division of rational expressions.

**Sequences:**

- calculating terms of sequences defined by an explicit formula,
- calculating terms of sequences defined recursively.

**Arithmetic sequence:**

- common difference of an arithmetic sequence,
- general formula of an arithmetic sequence,
- sum of initial terms of an arithmetic sequence,
- relationship between three consecutive terms of an arithmetic sequence.

**Geometric sequence:**

- common ratio of a geometric sequence,
- general formula of a geometric sequence,
- sum of initial terms of a geometric sequence,
- relationship between three consecutive terms of a geometric sequence.

**Trigonometry:**

- trigonometric functions of an acute angle (sine, cosine, tangent),
- trigonometric functions of an obtuse angle,
- relationships between trigonometric functions of the same acute angle,
- values of trigonometric functions for selected angles.

**Analytic geometry:**

- line segment in the coordinate system (distance between points),
- midpoint of a segment,
- line in the coordinate system (slope-intercept form, general form),
- circle in the coordinate system,
- axial and central symmetries.

**Plane geometry:**

- Pythagorean theorem,
- Thales' theorem,
- similarity of triangles,
- similar figures (relationship between perimeters and areas),
- central and inscribed angles,
- application of trigonometry in plane geometry to calculate areas of polygons (triangle, parallelogram, rhombus).

**Solid geometry:**

- calculating volumes and surface areas of solids (prism, pyramid, cone, cylinder, sphere).

**Statistics:**

- arithmetic mean,
- median,
- mode.

**Combinatorics:**

- application of the addition and multiplication principles.

**Probability:**

- calculating the probability of events (including by means of a table, probability tree, and classical probability).