

Entrance exam in mathematics for the PreDP class (based on Egzamin Ósmoklasisty)

1. Natural numbers in the decimal positional system. Students can:

- interpret natural numbers on a number line,
- round natural numbers.

2. Operations on natural numbers. Students can:

- Perform basic operations on multi-digit natural numbers using calculator,
- name the features of divisibility of numbers,
- decompose numbers into prime factors, find GCD and LCM of two numbers,
- evaluate the results of tasks,
- recognize multiples of a given number, squares, cubes and prime numbers.

3. Integers. Students can:

- compare integers.

4. Fractions and decimals. Students can:

- perform basic operations with fractions and decimals,
- convert fractions to decimals and vice versa
- Compare fractions and decimals
- round decimals
- compute a number whose part is given,
- determine the number that is formed after increasing or decreasing by a certain fraction of a different number
- calculate squares and cubes of fractions and decimals,
- calculate the values of arithmetic expressions,

5. Elements of algebra. Student:

- writes down word problems using algebraic expressions.

6. Geometry. Student:

- recognizes straight lines, parallel and perpendicular lines,
- recognizes vertical and adjacent angles as well as corresponding and alternating angles, uses their property
- applies the theorem about the sum of interior angles of a triangle,
- knows the properties of plane figures,
- calculates the areas and perimeters of plane figures,
- uses field units,
- calculates the areas of polygons by dividing them into smaller polygons,
- calculates the measures of angles in polygons,
- performs simple geometric calculations using the sum of internal angles of triangle and properties of isosceles triangles,
- uses formulas for areas of plane figures,
- knows and applies the Pythagorean theorem in practical situations,

7. Three D geometry. Student:

- recognizes nets of basic solids

- calculates the volume and surface area of a cuboid,
- uses volume units,
- calculates the volume and surface area of prisms and pyramids.

8. Practical calculations. Student:

- performs percentage calculations,
- performs clock calculations,
- converts units of length, area and mass
- performs scale calculations,
- calculates distance, speed or time.

9. Powers and roots. Student:

- multiplies and divides powers with the same exponents, raises power to power,
- calculates the square root of the product and quotient of two numbers,
- multiplies and divides roots of the same degree.

10. Algebraic expressions. Student:

- writes down the results of given algebraic operations,
- calculates numerical values of algebraic expressions,
- writes down the relationships presented in the task in the form of algebraic expressions,
- performs basic operations on algebraic expressions, performs reductions similar expressions,

11. Percentage calculations. Student:

- uses percentage calculations to solve problems in a practical context.

12. Equations with one unknown. Student:

- solves word problems using equations of the first degree with one unknown,
- transforms simple patterns.

13. Proportionality. Student:

- determines values described by direct proportion,

14. Descriptive statistics and probability. Student:

- conducts simple random experiments,
- calculates the probability of simple random events,
- reads and interprets data presented in various forms.
- calculates the arithmetic mean.