



The EuroMath application, freeware, under the GNU LGPL 2.1 license, works via the Firefox, Chrome, Edge web browsers. It is available at <https://app.euromath.eu>. For the full operation of the application, it is necessary to first user register and log in to the portal <https://www.euromath.eu>.

The EuroMath app cooperates with the repository of open mathematical educational resources accessible for blind and partially sighted people. The repository is located on the EuroMath portal. The repository contains multimedia mathematical documents intended for teachers (lesson plans) or blind, partially sighted and sighted students (worksheets, exercises, quizzes and others). The documents are in two language versions, developed by teachers from 3 countries - the Netherlands, Ireland and Poland. Teachers and students can download resources from the repository using the EuroMath app or the portal. The cooperation with repository consists in transferring mathematical content to the repository by teachers in order to make it available to other teachers or students, as well as downloading materials useful for lessons by teachers or students.

The EuroMath application allows the teacher:

creating for students worksheets, tests, textbooks and other mathematical content that are accessible for blind and partially sighted students; in the created mathematical content, the teacher can place mathematical formulas, figures, graphs of functions, quizzes, fields for pairing, tables, links to videos from youtube.com, links to mathematical graphics created in the Desmos system, graphics from GeoGebra. Documents can be printed in black and white and Braille, and graphics can be printed on swelling paper;

describing mathematical graphics so that a blind student can read the graphics using synthetic speech, sounds and tactile gestures.

A blind student

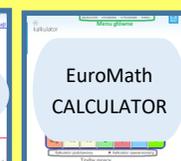
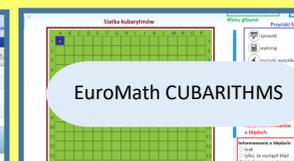
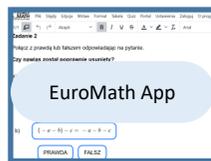
Can interactively explore the mathematical content of the document created in EuroMath using NVDA or JAWS screen reader, keyboard and braille display, virtual braille keyboard, QWERTY keyboard, and using the audio interface with synthetic speech, sounds with constant or variable monotony and technical sounds as well as touchscreen touch gestures and keyboard shortcuts; the student can read a document in raised print and familiarize himself with graphics containing Braille labels printed on swelling paper, as well as open and save documents on a local disk and download content from the repository;

Can create by yourself mathematical content - formulas using the Braille editor or AsciiMath notation editor and navigate the formula to get to know its structure in detail, which is accompanied by reading the content in a synthetic speech of the selected fragment of the formula;

Can create by yourself mathematical content - geometrical drawings and graphs of functions, describe them and navigate the drawings and graphs with tactile gestures, which is accompanied by informative messages conveyed by synthetic speech and sounds of constant and variable monotonicity.

Student with low vision

Can interactively explore a math document with magnification and preset contrast, as well as with the NVDA or JAWS screen reader, synthetic speech, keyboard shortcuts and touch gestures.



EuroMath Portal is available at <https://www.euromath.eu>. The main functions of the portal are

- EuroMath application catalog management and software sharing (EuroMath Tools / Catalogue menu),
- Managing a repository of open mathematical educational resources (OER) and sharing them with registered and logged in users,
- Communication with the EuroMath application regarding access to the repository's resources,
- Support for the discussion forum.

The portal also provides information on EuroMath in the form of News, Information Materials and FAQ. From the portal, you can go to the EuroMath project website where you can find the project results. The results can also be found on the [European platform for the results of projects](#) co-financed by the ERASMUS + program.

The EuroMath CUBARITHMS application is available for download on the portal in the EuroMath Tools / Catalogue menu. It has PL and EN versions.

The EuroMath CUBARITHMS application runs under Windows 8/10, it is used blind and visually impairment students for learning of traditional columnar layout arithmetical calculations. The application is intended for blind and visually impaired students to learn to perform basic arithmetic operations (addition, subtraction, multiplication and division). For blind students, the application replaces the traditional physical plate and cubes with raised numbers in Braille notation, with the help of which they learn to perform arithmetic operations in a columnar layout. The application allows users to enter numbers from the QWERTY keyboard or from the physical Braille keyboard or using touch gestures (finger tap). You can perform an operation in self-test mode with error information. It can be operated with keyboard shortcuts.

EuroMath Repository, on the portal, contains open, mathematical educational resources (OER). The number of resources in mid-2020 was 351 and could continue to increase, supplemented by teachers. Teachers can create multimedia math content and save it in .epub files using the EuroMath app. The file can be saved on a local disk, on a cloud disk (for the student to download) or in the OER repository on the EuroMath portal. Content placed in the OER, after approval on the portal, becomes publicly available to users. The resources are accessible for blind and with low vision users.

The materials created by the teacher can be: methodological materials (scenarios) for math lessons; theory; student's work card; exercises; the periodic test; the exam test. The teacher can also use the materials placed in the repository by other teachers. Also, the student, at the teacher's request or on his own initiative, can download the content from the repository for the lesson or for self-education.

In order to use the content from the repository, the user: 1. can log in (after prior registration) on the portal <https://www.euromath.eu> and view the available resources in the Educational resources menu, select them, download and save them to a selected disk; 2. After logging in, from the EuroMath application from the menu Portal-> Documents, he/she can view the resources, all or selected after setting the filter. After selecting the resource, he/she can download it and save it to the selected disk or open it in an editing application.

The EuroMath CALCULATOR school application, running under Windows 8/10, is intended for blind and visually impaired students to perform mathematical calculations. The application is a mathematical calculator adapted to school needs, it works in a simple version (calculations) or, after switching, in an advanced version (calculating expressions). Can read the entered expressions in synthetic speech. The application has PL and EN versions.