IVS - User manual

EXPECT_EQ(oznuk, false)

April 29, 2022

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1 Introduction

This manual covers the installation and introduction to functions and features of calculation software CubiCulator. CubiCulator is a desktop program, made by team EXPECT_EQ(oznuk, false) as a second and final IVS project. It can calculate basic mathematical expressions with some added, more sophisticated functions.
Thank you for choosing CubiCulator.

2 Installation and uninstallation

Before you can start with installation you need to make sure you run Windows 10 on your device and that you have the proper user rights to install new programs on your device.

2.1 Installation

To successfully install your calculator program you need to follow these steps:

1. Start by double clicking on the [**mysetup**] icon (with the left mouse button).

Figure 1: Installer icon

2. Allow installer to make changes to your computer.

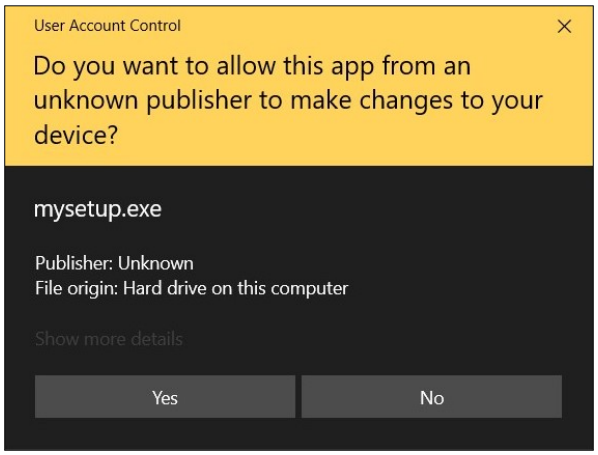

Figure 2: User Account Control

3. Select your preferred language (in which you want to continue in installation).

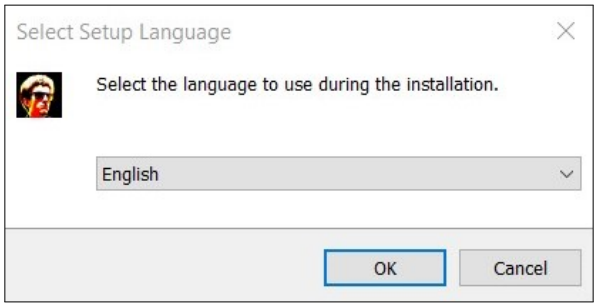

Figure 3: Language selection

4. Check the [**I accept the agreement**] to accept the statement about license agreement. Then press the [**Next**] button to submit.

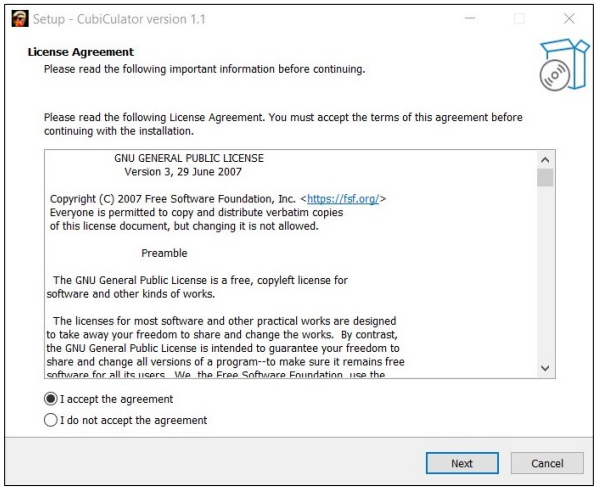

Figure 4: License agreement

5. Choose, where you want to install the program.Then press the [**Next**] button to submit.

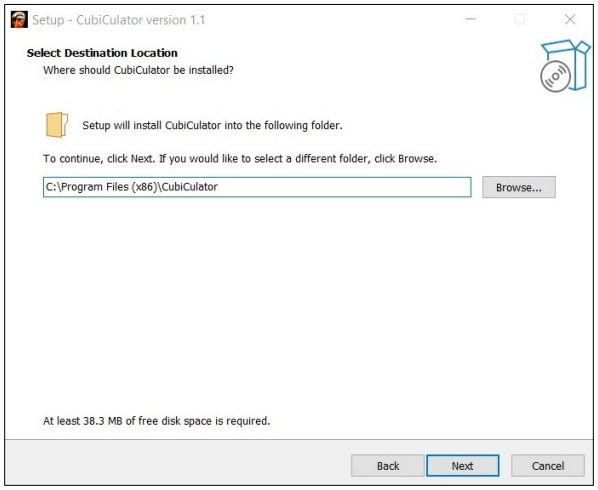

Figure 5: Destination selection

6. Check the [**Create a desktop shortcut**] if you want to create a desktop shortcut.

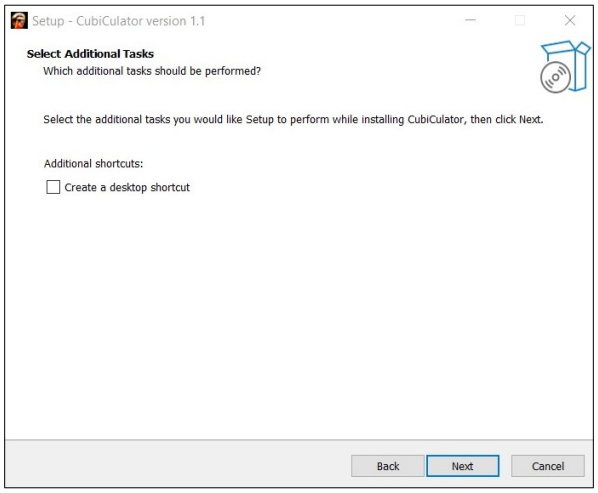

Figure 6: Desktop shortcut

7. Click on the [**Install**] button.

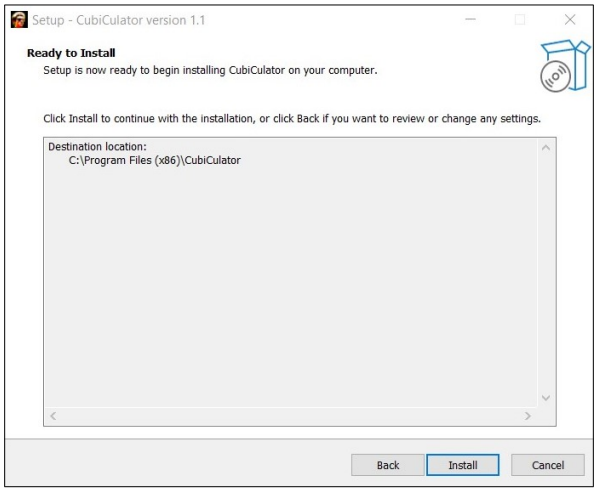

Figure 7: Final install check

8. Wait until the installation is complete.

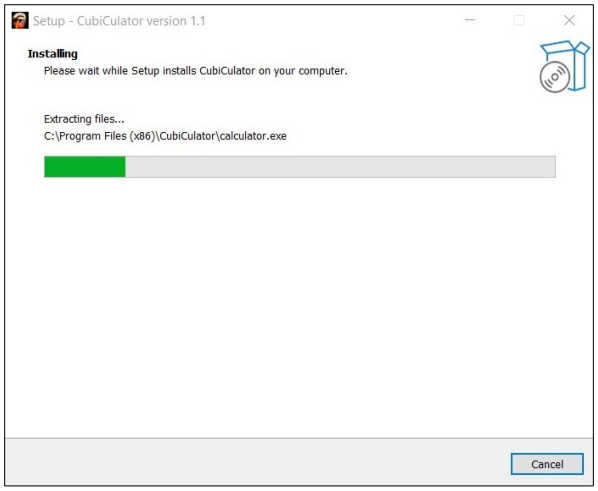

Figure 8: Installation

9. Select the [**Launch CubiCulator**] option if you want to launch CubiCulator right after finishing the installation. Then click on the [**Finish**] button to finish installation.

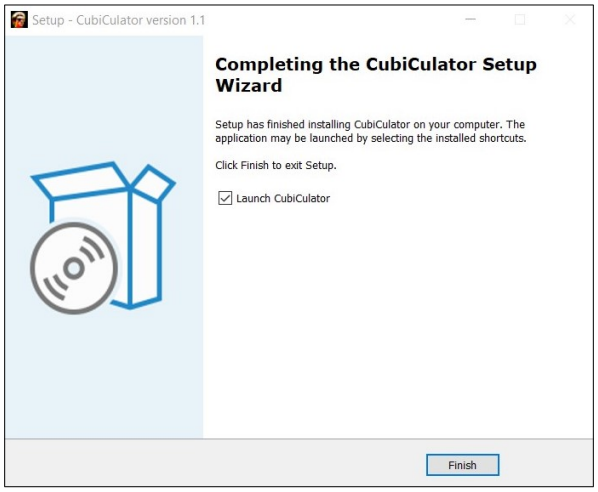

Figure 9: Finishing installation

At this point there should be CubiCulator program successfully installed on your device. You can launch it by double clicking on the Cubiculator icon if you have not already done that by selecting [**Launch CubiCulator**] option in step 9.

2.2 Uninstallation

To successfully uninstall your calculator program you need to follow these steps:

1. In programs and features manager select CubiCulator program and click on the [**Uninstall**] button.

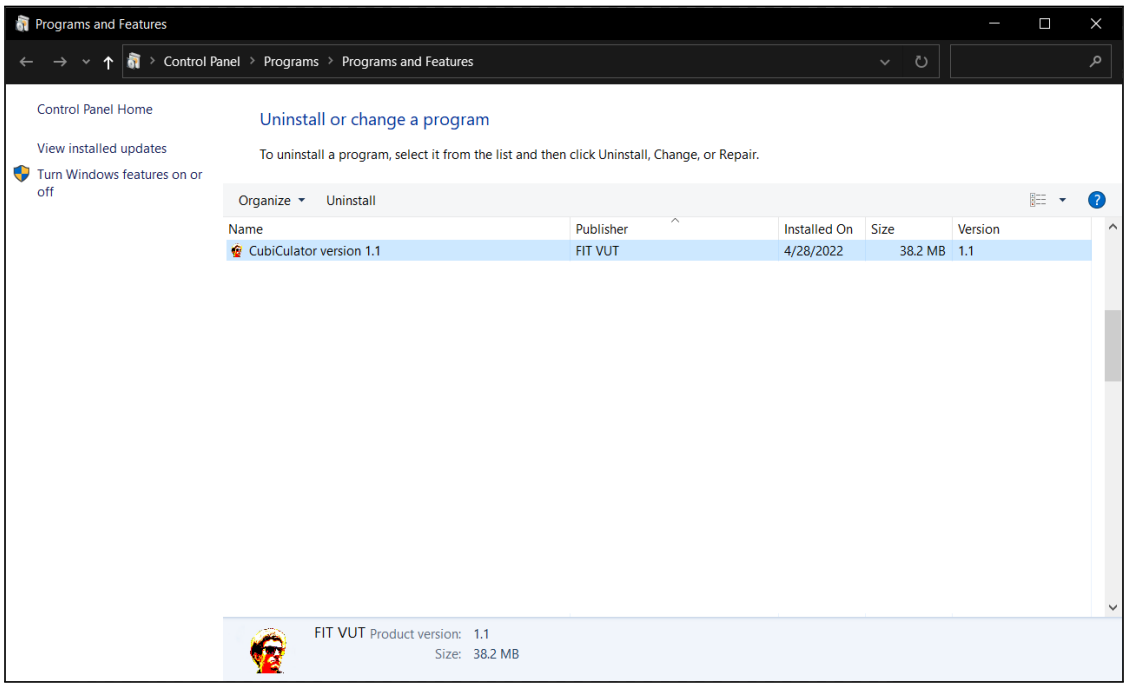

Figure 10: Programs and features manager

2. Click on the [**Yes**] button.

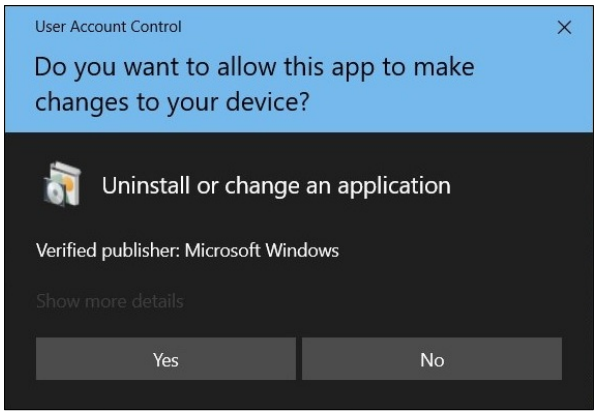

Figure 11: User account control - Uninstall

3. Click on the [**Yes**] button.

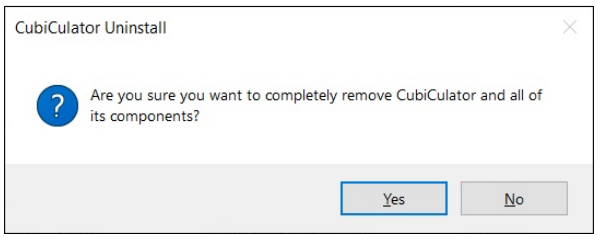

Figure 12: CubiCulator Uninstall

4. Wait until the uninstalling of the program ends.

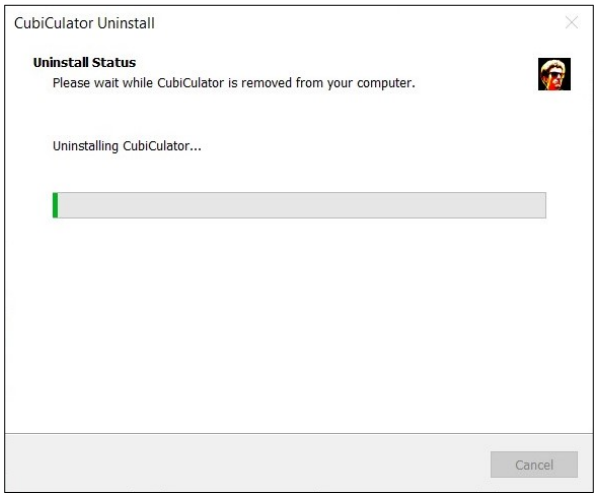

Figure 13: CubiCulator Uninstalling process

5. Click [**Ok**].

Figure 14: CubiCulator Uninstalling process

At this point your CubiCulator should be successfully uninstalled.

3 Calculator window

After successfully running the executable the main window shows up. This window is called calculator view. Calculator view contains of function buttons and display panels. Buttons are used for entering mathematical expressions and can be replaced by physical keyboard. Display panel returns results of calculations and shows the history of calculations.

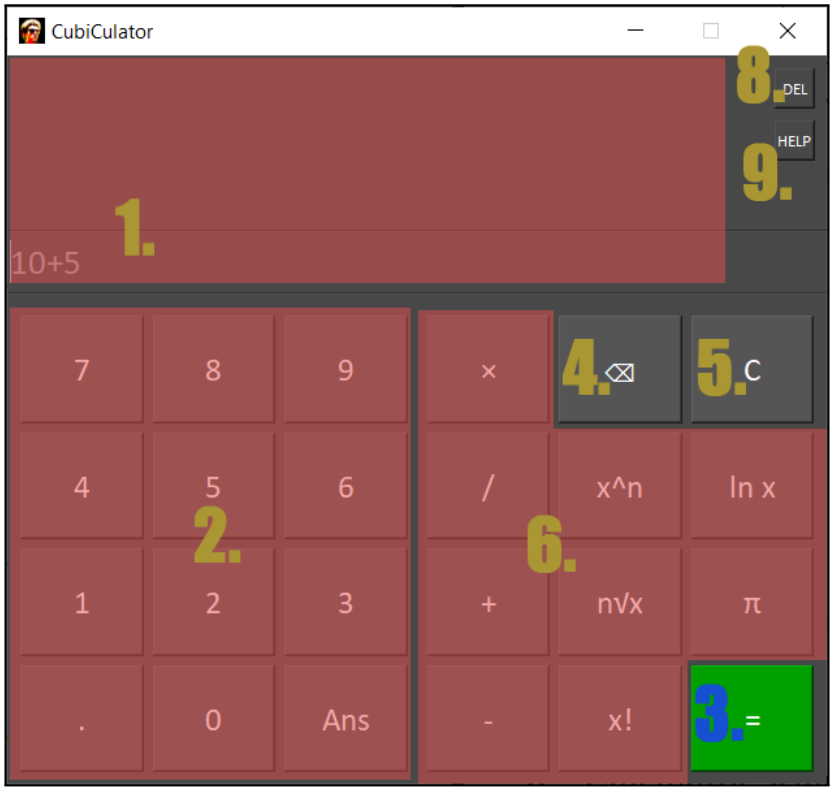

Figure 15: Calculator view

1. Display panel - Displaying entry and history.
2. Number buttons - Used for entering numbers.
3. Result button - Returns result of current expression.
4. Backspace button - Deletes last added character.
5. C button - Clears an entry.
6. Mathematical functions - Enters mathematical function.
7. π Button - Enters number π.
8. DEL button - Clears history.
9. HELP button - Shows hint.

4 Mathematical functions

Calculator can compute various mathematical functions. Different function have different number of operands. In case of every 2 operand function (*+, -, *, /, n^x, $n\sqrt{x}$*) you enter operands in *operand1 function operand2* order. In case of factorial (*x!*) function you enter operand in *operand function* order. In case of natural logarithm you enter operand in *function operand* order.

4.1 Function overview

Here you can see overview of the mathematical functions:

Function	Symbol	Number of operands	Input Order
Addition	+	2	*operand1 function operand2*
Subtraction	-	2	*operand1 function operand2*
Multiplication	*	2	*operand1 function operand2*
Division	/	2	*operand1 function operand2*
Power	x^n	2	*operand1 function operand2**
Root	n$\sqrt{x}$	2	*operand1 function operand2***
Factorial	x!	1	*operand function*
Natural logarithm	ln x	1	*function operand*

*In case of *function operand* input order the expression is equal to *2 function operand* or 2^x.
**In case of *function operand* input order the expression is equal to *2 function operand* or $\sqrt{x}$.

4.2 Example

For example, if you want to calculate $\frac{\sqrt{4}}{3}$ expression you would be entering commands in this order:

1. Click on the [**2**] number button.

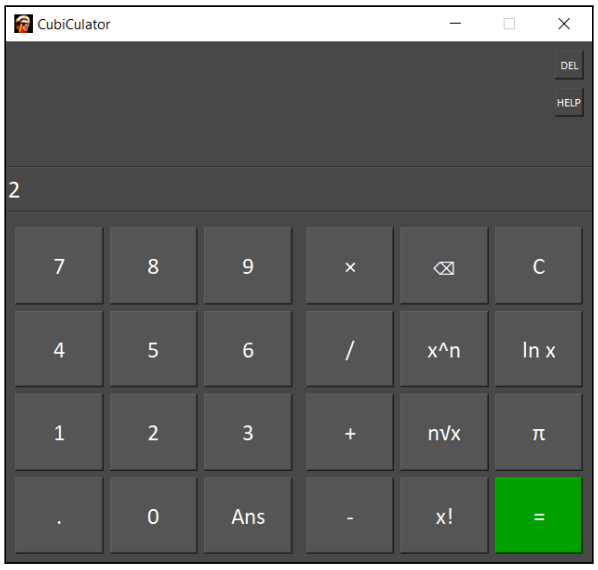

Figure 16: Expression input - 1

2. Then click on the [**Root**] button.

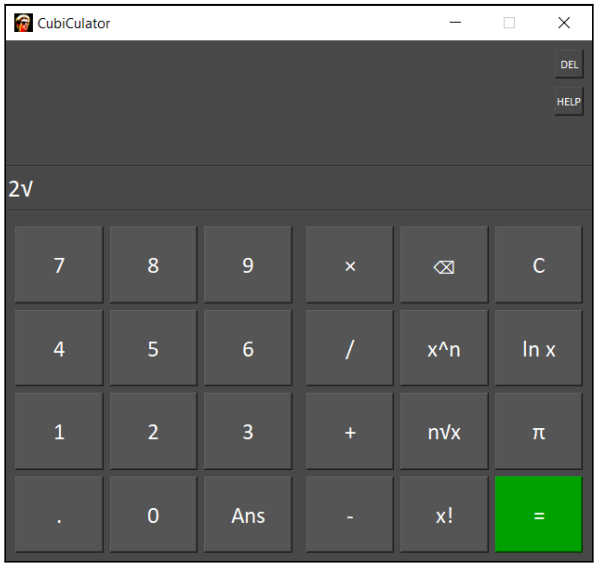

Figure 17: Expression input - 2

3. After that click on the [**4**] number button.

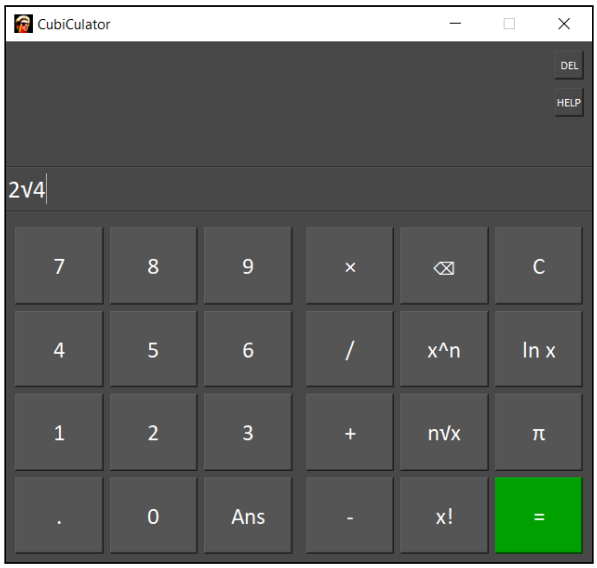

Figure 18: Expression input - 3

4. To divide the number click on the [/] Division button.

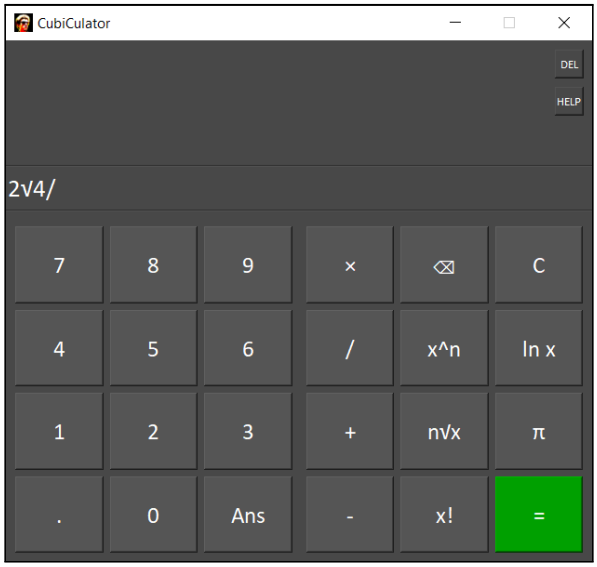

Figure 19: Expression input - 4

5. Then click on the **[3]** number button.

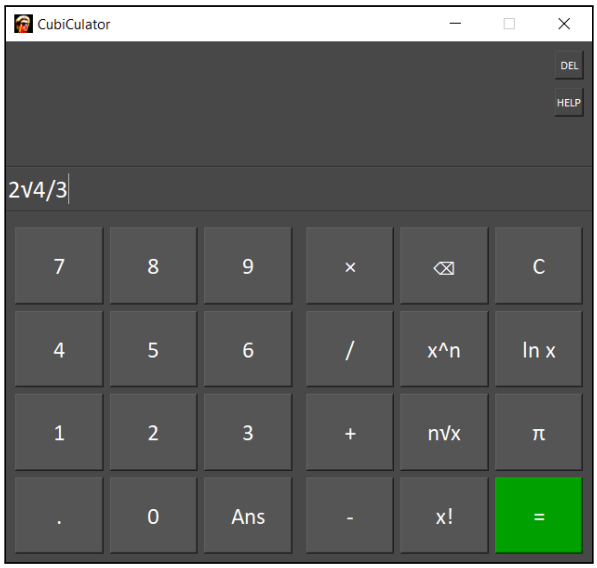

Figure 20: Expression input - 5

6. To calculate result of this expression click on the [=] number button.

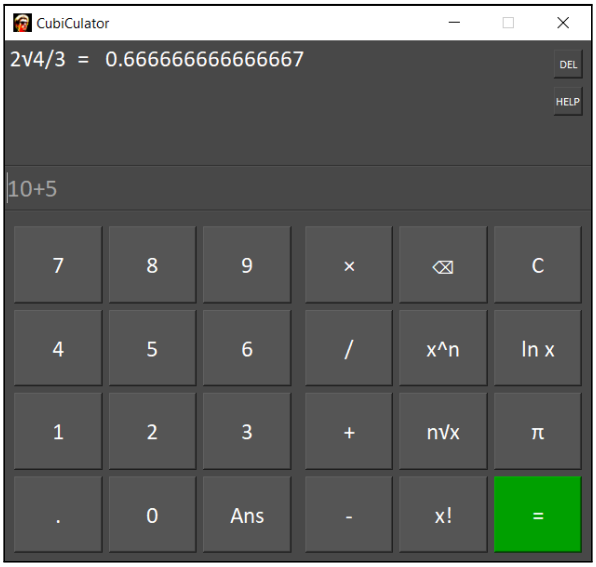

Figure 21: Expression input - 6

5 Input and error messages

This part of manual covers couple different techniques of writing input into calculator and some possible error messages, that can pop up, explain why did they occurred and how to prevent them.

5.1 Ways to write input

One way you can write input is by clicking the buttons in the calculator view. But you can also use numpad buttons on your keyboard to input numbers and [+], [-], [*], [/] buttons to input *+*, *-*, ***, */* functions.

Figure 22: Example of numeric keypad (Numpad)

5.2 Error messages

Error messages warns you about miss behaving with you calculator (For example when you write input in a wrong way.) or when calculator is about to calculate undefined operation.
Errors, that can occur are:

1. **Number must be integer greater than or equal zero!**
   - This error occurs when you try to get factorial of an negative number or non-number input.
2. **Division by zero!**
   - This error occurs when you try to divide by zero or when some of the actions you've written leads to division by zero.
   - For example $58/0$.
3. **Root number cannot be zero (division by zero)!**
   - This error occurs when you try to calculate 0 root of any number
   - For example $\sqrt[0]{45}$.
4. **Under the square root cannot be negative number!**
   - This error occurs when you try to calculate square root of any negative number.
   - For example $\sqrt{-56.2356}$, $\sqrt{-69.69}$, $\sqrt{-420}$.
5. **The natural logarithm is defined only in the interval** $(0, \infty)$
   - This error occurs when you try to calculate natural logarithm of an negative number.
   - For example $ln - 15$, $ln - 69$
6. **Wrong syntax!**
   - This error occurs when you write expression with wrong syntax.
   - For example $1 * -/9$, $!45$
7. **Too large number!**
   - This error occurs when you write expression with too large number in it.

5.3 Tips and special features

CubiCulator is calculator with special features.

1. Arrow scrolling
   - You can navigate throughout calculator history just by clicking [**up**] and [**down**] arrow keys.
2. Enter to result
   - You can get results of your expressions much faster thanks to out new equal function trigger. Just click on the [**Enter**] button and result is displayed.
3. Pi to π
   - You can type π even without mouse. Just type [**P**] [**I**] on your keyboard and CubiCulator will process it like it was written by [π]button.