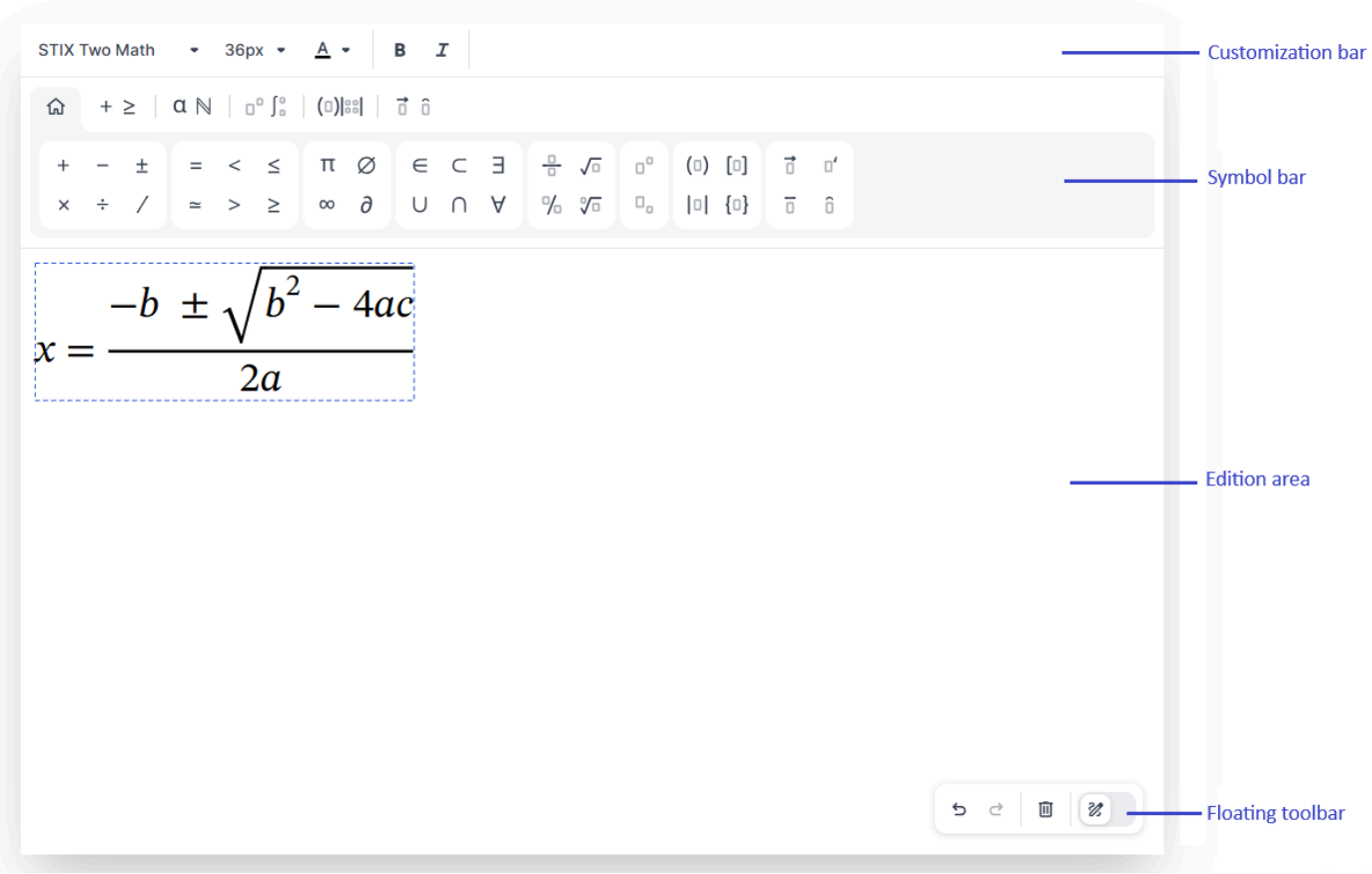
Using the new MathType

Reading time: 7min

The basics

The **new MathType** is easier than ever to use thanks to its redesigned interface. It is still divided into two main areas: the **Customization bar + Symbol bar**, which offers a wide range of mathematical symbols, and the **Edition area**, where you can build and modify your formula. In the Edition area, you will see the cursor position as well as any selected content.

In this new version of MathType we have added a **Floating toolbar** in the Edition area where you will find the Handwriting Switch and other Tools. Follow “Handwriting Toolbar” for more details.

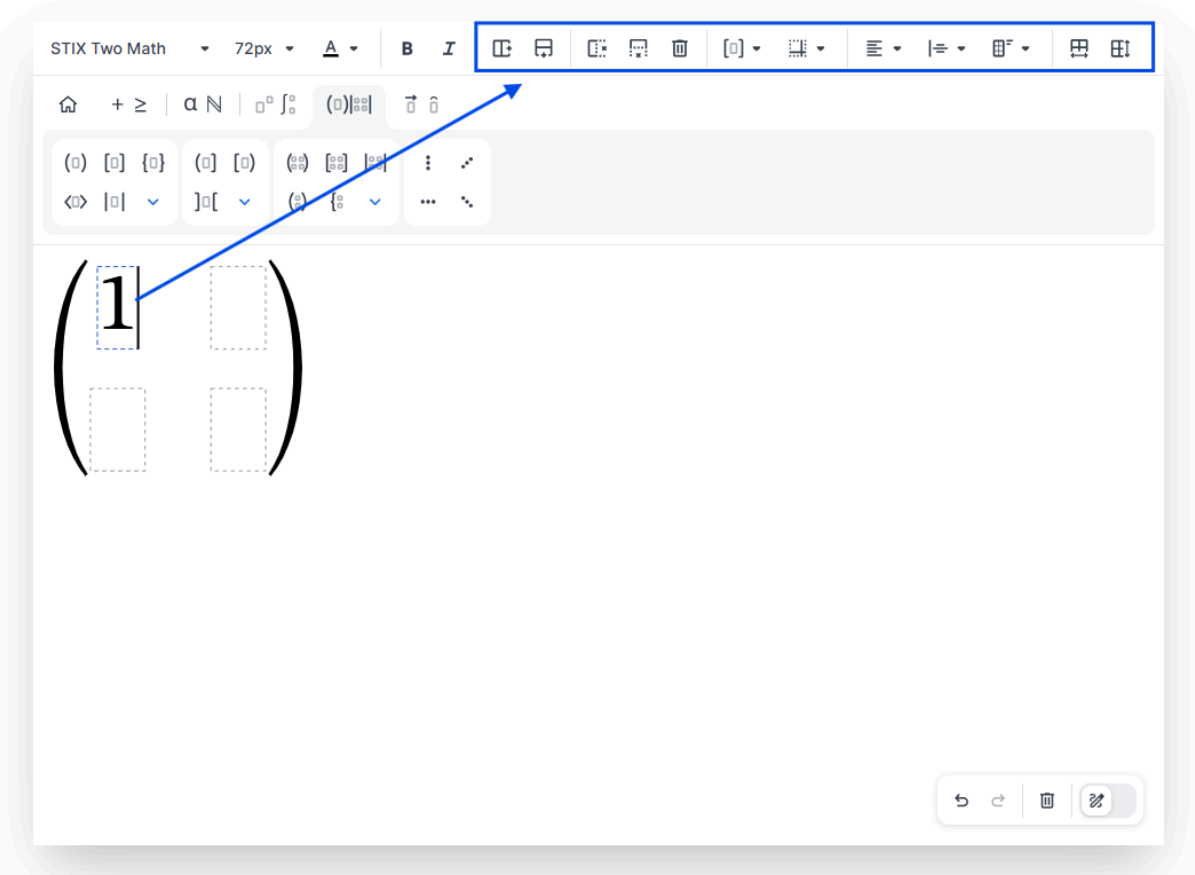


Customization bar

Fonts: Clicking on the font's dropdown menu will display the available fonts.
Size: Not only can the size of the whole equation be changed, but also the size of smaller sections, even a single character.
Color: Same as with the size, the whole equation or sections of it can be displayed in the color of your choosing.
Styles: Choose between bold, italic, or both. By default, all input is shown in italic, and currently, it can't be disabled. Once the text has been added, selecting it and clicking on the *Italic* button will make the selected text Straight.

Symbol bar

Matrices: After inserting a matrix, placing the cursor in it will make the customisation bar display the available options:



From left to right, the matrices' customisation options are:

Insert a column to the right
Insert row below
Remove column
Remove row
Remove matrix
Fences
Borders

Horizontal alignment
Vertical alignment
Matrix alignment
Force equal column widths
Force equal row height

Edition area

Writing text is done as in any other WYSIWIG (What You See Is What You Get) editor. To write text content in the formula, keyboard characters are supported. When symbols are needed, search the correct tab, click on its icon, and it will appear in the *current location of the cursor*. We call this the *insertion point*.

For example, in order to write “∀α”:

1. Open the corresponding tab, in this case: 
2. Click the “∀” icon.
3. Then click the tab: 
4. Finally click the "α" icon.

Navigation through the expression is possible using the mouse or the arrow keys, the Home, End, Page Up and Page Down keys. For more details, see the sections *shortcuts.* To select part or all of the formula, use the mouse or hold **Shift** while moving through the formula with the keyboard.

By default, **Auto-Italic format** is applied to text content — this means the new MathType automatically determines the appropriate styling (e.g., regular or italic) based on the symbol type (e.g. reserved words like “*log*”). For more details, see the section *AutoItalic. You can always override the editor guess, by selecting the part and changing the Automatic italic button.*

Common used shortcuts are available, `Ctrl` + `c` to copy, `Ctrl` + `v` to paste, `Ctrl` + `x` to cut or `Ctrl` + `z` to undo. For more details, see the sections Keyboard navigation and *Keyboard navigation and shortcuts* and *autoformats* below.

Once you have finished editing your formula, click **"Insert"** to apply the changes, or **"Cancel"** to exit without saving.

Automatic typesetting

One of the features that makes MathType such a powerful tool is its ability to automatically structure expressions and symbols within a formula — a functionality that remains at the core of the newest version.

Let's start by seeing how to write the **single expression formula:**

$$\sqrt{x}$$

There are two ways to do this.

Option 1: Insert the square root first, then type *x* inside it:

1. Click the  icon in the General tab.
2. Type x.

Option 2: Type *x* first, then apply the square root around it:

1. Type x.
2. Select *x*.
3. Click the  icon in the General tab.

> Any template that involves a single expression works this way!

Now let's see how to use a template that involves **two expressions formula**. Let's write:

$$\frac{x+1}{x-1}$$

As before, we have two ways to do this:

Option 1: Insert the fraction and then type numerator and denominator.

1. Click the  icon in the General tab.
2. Type the numerator.
3. Click inside the gray denominator box, or use ↓ key.
4. Type the denominator.

Option 2:

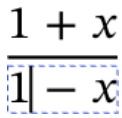
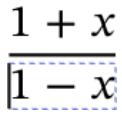
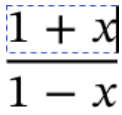
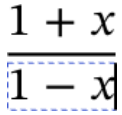
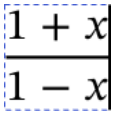
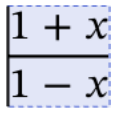
1. "Wrap" the fraction around content you've already typed.
2. Type the numerator.
3. Select the content you just typed.
4. Click the  icon in the General tab.

5. Click inside the gray denominator box, or use ↓ key.
6. Type the denominator.

Keyboard navigation and shortcuts

The behavior of the arrow keys in MathType is generally what you would expect when working with plain text. However, things work a bit differently when navigating templates, such as fractions.

Let's take a closer look at how the cursor behaves inside a fraction:

Initial state; cursor is inside the denominator	
Pressing the left arrow once moves the cursor to the left, as expected.	
Pressing left arrow again key moves the cursor to the numerator, similar to navigating a regular text.	
Pressing the down arrow key moves the cursor back to the denominator	
Pressing the right arrow key moves the cursor outside the fraction. Notice the change of size of both the horizontal and vertical cursors, indicating it is affecting the whole fraction. Continued typing from this point will be outside the fraction.	
Pressing the backspace (Windows) or delete key (Mac) selects the whole fraction, instead of deleting one character; if we pressed delete again, the whole fraction would be deleted.	

If at any point the arrow keys don't move the cursor as expected, you can:

- Click directly where you want to place the cursor, or
- Continue pressing the arrow keys until the cursor exits the template area.

Selecting and Editing Content

- Hold `Shift` while using the arrow keys to select parts of the formula.
- You can also click and drag with the mouse for selection.

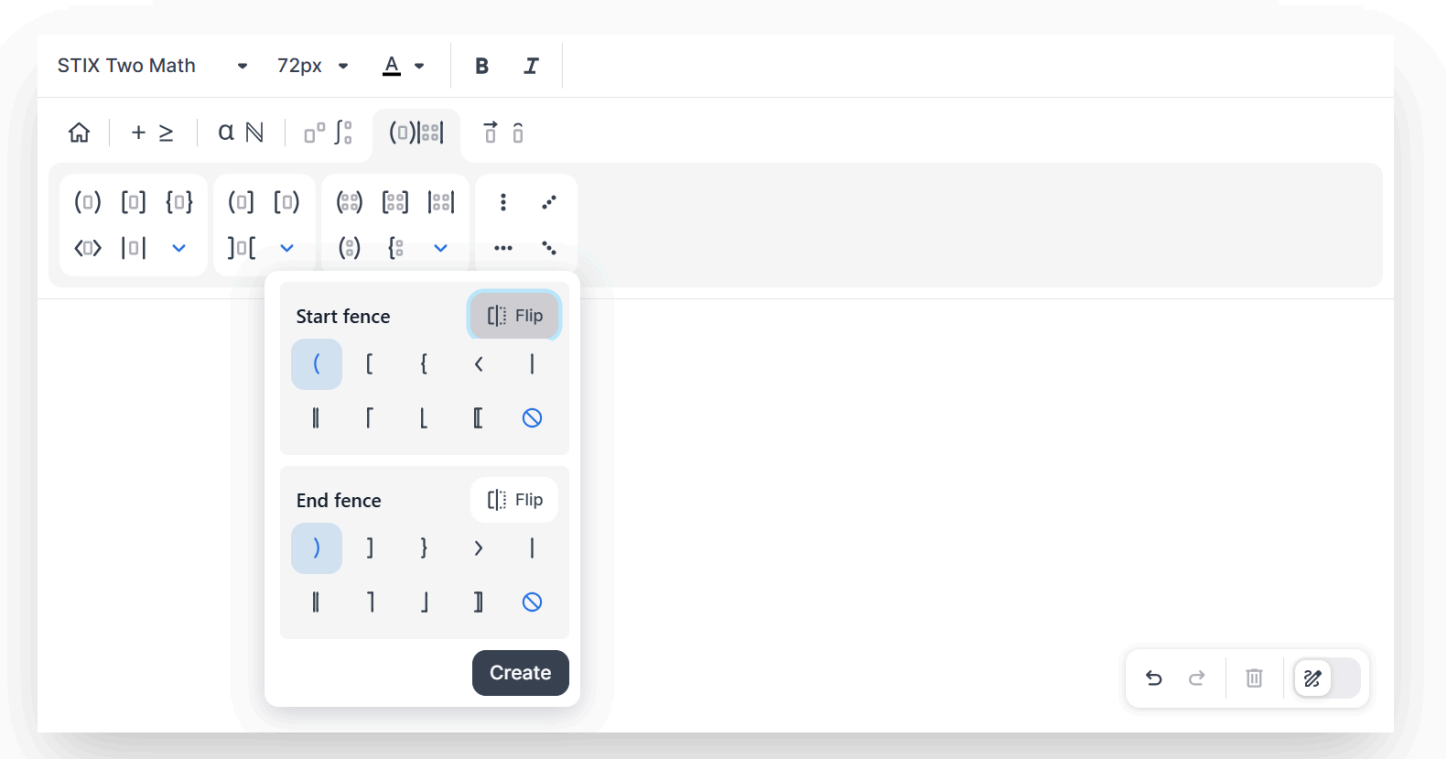
Once selected, you can **cut, copy, and paste** content just as you would in any other text editor.

Copy & paste

You can cut, copy, and paste into, out of, or within MathType. You can do this using the standard keyboard shortcuts, `Ctrl+x` , `Ctrl+c` , `Ctrl+v` , respectively, or their Mac equivalents using the `Command` key.

Custom Fences

The new MathType allows you to create **standard fence pairs** and **custom fence pairs**, giving you full control over the symbols that enclose your expressions.



Go to the matrix & fence tab to customize fences. Once there, you can choose to pick a standard pair of fences or open custom fences to achieve any combination of start and end symbols — including parentheses `()` , brackets `[]` , braces `{}` , angle brackets `⟨⟩` , and vertical bars `||` .

You can also:

- Select **asymmetric** fences (e.g., `{` and `]`)
- Use **"no symbol"** on either side to create one-sided fences
- **Flip** the orientation of fence symbols.

$$\left(0,\frac{1}{2}\right) \rightarrow \left(0,\frac{1}{2}\right]$$

Once you've made your choices, click **"Create"** to insert the custom fence pair into your expression.

Scaling symbols & fences

> **Caution!** In the MathType documentation, we refer to "**Fences**" as symbols that *enclose* other content, usually on both sides. This includes parentheses, brackets, and braces, but is not limited to these symbols/templates.

Mathematical operations can be nested, and templates can contain expressions with other symbols and templates. Many symbols and templates expand to match the size of their contents; note, for instance, how the square root symbol expands as its contents grows larger:

$$\sqrt{x} \quad \sqrt{1+x-ay} \quad \sqrt{\frac{1}{\frac{a^2}{y}}}$$

Fences will also scale as expected if you insert them with the (□) [□] {□} |□| icons in the General tab. If you want simple *non-scaling* parentheses, brackets, and braces, just type them with the keyboard.

> **Caution!** Your MathType will *automatically format* content, typing a single parenthesis, bracket, or brace, will automatically insert a pair of expanding ones.

Let's see one example by creating:

$$\left(1+\frac{x}{2}\right)^3$$

Click the (□) icon	(□)
Type the expression	$\left(1+\frac{x}{2}\right)$

Click to the right of the), then click the icon in the General tab	$\left(1+\frac{x}{2}\right)^{\square}$
Type **3** (The cursor will already be in the superscript slot, so there's no need to click there.)	$\left(1+\frac{x}{2}\right)^{3}$

Autoformat

Autoformat replaces some symbols from the keyboard with their better-looking counterparts. At present, the replacements are:

a*b	→	$a \cdot b$
a/b	→	$\frac{a}{b}$
a^b	→	a^b
a_b	→	a_b
a>=b	→	$a \geq b$
a<=b	→	$a \leq b$

The replacement is done while you type, so you never see the actual key pressed.

Autoformat also auto-closes parentheses, brackets and braces. When you write the left enclosure, the suitable enclosure is automatically put in, allowing to write inside of it.

Automatic italic

There are typographical conventions when writing mathematics, for instance: variables are usually written in italics, while standard functions are written in upright letters. MathType has the mode Automatic italic (autoitalics) to ease the writing of the formulas to follow these conventions. Autoitalics applies by default in the new MathType and cannot be deactivated for now.

How AutoItalic works:

- **Single letters** (for example `x`, `y`, `z`) are treated as variables → *italic*
- **Numbers and symbols** are written upright
- **Recognized functions** (reserved words) → upright, as soon as you finish typing them

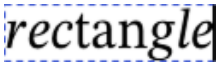
Reserved words (automatically detected functions):

- `cos`
- `sin`
- `tan`
- `sec`
- `cot`
- `csc`
- `log`
- `ln`

Revert an automatic change

If you want to convert a reserved word into an ordinary group of letters, then delete-and-retype one of the letters in the middle.

For example:

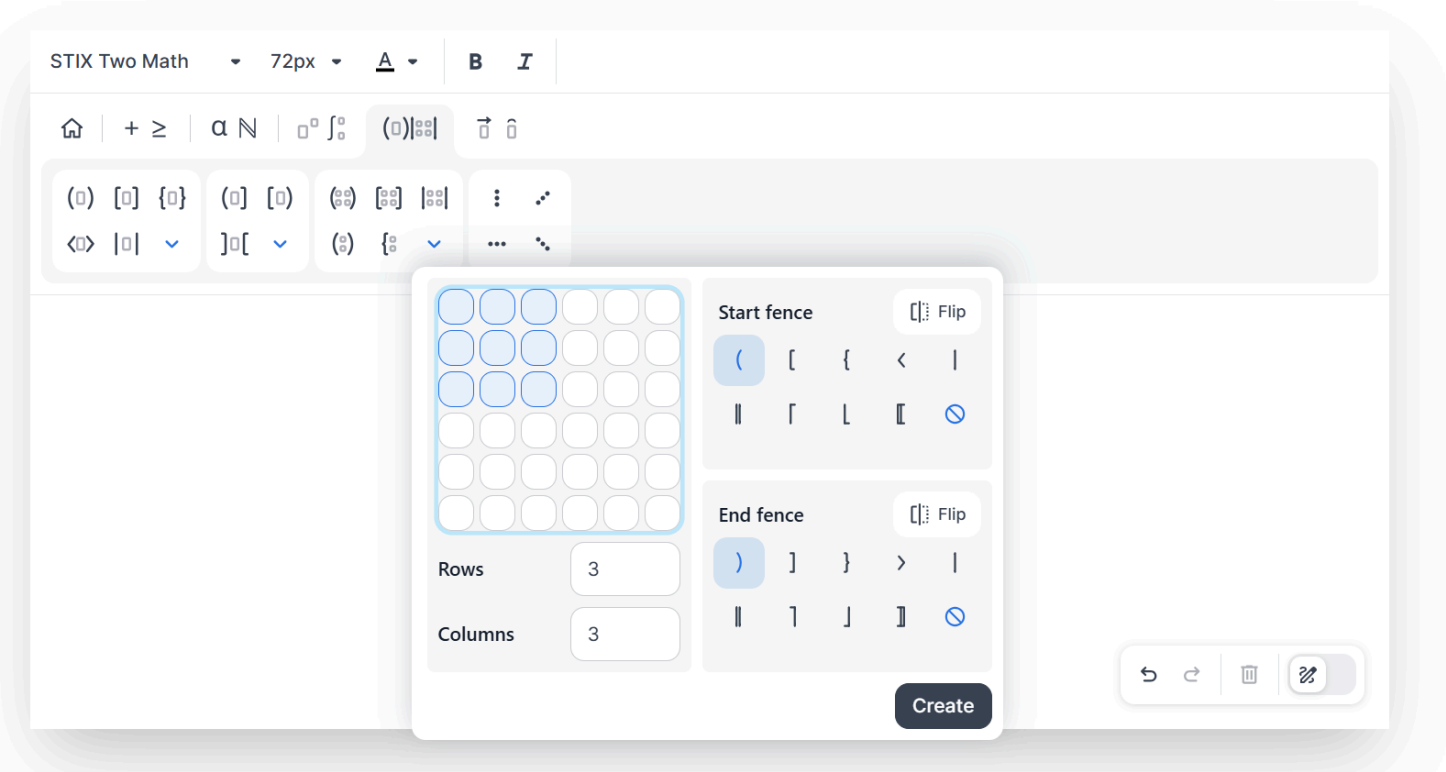
Let's type "rectangle"	
Type the first letters in sequence.	
Right after you type **n**, the **tan** reserved word is recognized.	
Continue typing to the end.	
We do not want the change autoitalics has made. **Let's fix it.**	
Place the cursor in the middle of the reserved word.	
Delete two letters.	

Let's type "rectangle"	
Retype the letter you just deleted.	*rectangle*
This is the result we want.	*rectangle*

Matrices

Creating Matrices

MathType makes it easy to insert and customize matrices with a modern and flexible interface. The new matrix tool combines **size selection** and **fence pairing** in a single, streamlined panel.



You can insert a matrix in just a few steps:

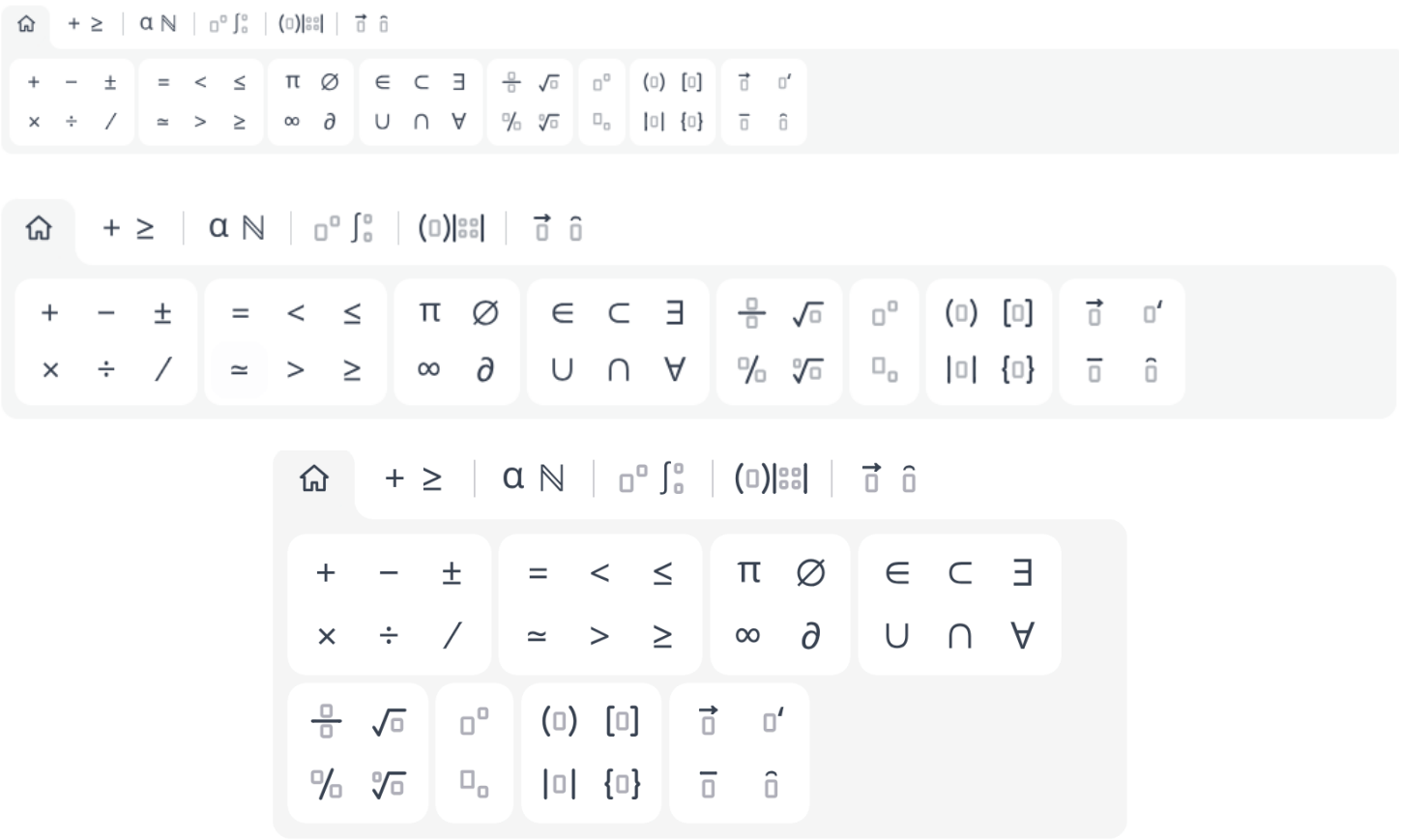
1. **Choose the matrix size**
   - Click directly on the grid to select the number of **rows** and **columns** (up to 6×6 by default).
   - You can also manually adjust the values using the **rows** and **columns** selectors below the grid, either by clicking the arrows or typing the numbers directly.
2. **Choose your fences (optional)**

- On the right side, select the **Start fence** and **End fence** (e.g., parentheses, brackets, braces, etc.) to enclose your matrix.
- You can also mix and match symbols, use one-sided fences, or choose no fences at all.

3. **Click "Create"**
   - The matrix will be inserted into the editing area, ready for you to fill in the content.

Magnified toolbar

You can Zoom-in with `Ctrl` + `Shift` + `+` and Zoom-out with `Ctrl` + `Shift` + `–` the editor, or their Mac equivalents using the `Cmd` key. Otherwise, hold down the `Ctrl` key (or `Cmd` on Mac) and scroll the mouse wheel up or down.



MathML and coverage

MathML (Mathematical Markup Language) is the standard language for describing mathematical notations and capturing both its structure and content. As in previous MathType versions—such as MathType Web and MathType 7—the new editor continues to rely on MathML as its foundational format. However, it's important to note that this is a completely new engine and interface, which brings some changes and current limitations.

When we talk about "Coverage" in the context of the new MathType, we refer to all the content that can be edited within the new editor environment. Any MathML content that cannot be rendered or edited using the new MathType falls outside of this coverage. While most mathematical expressions are fully supported, there are

currently some areas that remain under development and will be introduced in upcoming releases. These include, mainly, features related to text formatting, font manipulation, and text sizing.

Despite these limitations, the editor has been carefully designed to ensure that users are never left in a situation where their formula becomes uneditable. If the system detects MathML that is currently unsupported, it will automatically redirect the formula to the previous MathType editor, where users can continue working without interruption.

We are committed to expanding the capabilities of the new MathType with every release, gradually increasing its coverage while maintaining reliability and ease of use. Our goal is to provide a seamless editing experience for all types of mathematical content.

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