# Edit and Translate Math Equations into Braille

Sao Mai Braille supports displaying and editing math equations, importing/exporting among LaTeX and MathML codes, and converting them to Braille.

This video will show you how to write and read math equations, then set options for speech and Braille output.

## To insert an equation into a print document:

Press Alt+F9, or go to the Insert menu and choose "Equation".

The focus will be on the Expression edit field of the Expression page, where you can directly input LaTeX code.

The dialogue has three tab pages: Expression, Font, and Appearance. Font and appearance pages are used to set options to display the expression visually in the print document.

The Expression page has two subpages: one is "Search by category", and two is the "Direct text search".

Please note: by default, SMB automatically inserts into the Expression edit field a square root of A. So, before starting to input a new equation, we will activate the "Clear" button to delete all existing content in the field first.

Now, let's insert a fraction equation of X square root over 4, by using the "Search by category" function to input the fraction sample code, and then using the "Direct text search" function to input the square root of X.

1. Press Alt+S to search and input equation by category. The focus will be on a category list. Choose "Fraction".

2. The next tab will display a subcategory list if available. Otherwise, it will show a list of sample equations belonging to the category selected in the previous step. Fraction category doesn't have subcategories.

Choose "stack fraction A over B" sample equation and press the Space key to insert it into the Expression edit field.

Now the code of "\frac{a}{b}" has just been input into the Expression edit field. We will replace the "a" parameter with "square root of x", and "b" parameter with the number "4".

1. Select the "a" parameter character.

2. Press Alt+D to search and input equation by name.

3. Type the word "root" and press the Down arrow to the "square root a" and press Enter to input it. That will replace the selected "a" parameter.

4. Replace the "a" parameter of the square root with "x".

5. And replace the "b" parameter of the fraction denominator with the number "4".

It's recommended to check if the equation is valid or not by pressing Alt+C to activate the "Check" button.

Now, click OK to insert the equation into the document.

If you want to edit an existing equation, move the cursor to the right of the equation, and press Alt+Enter or choose "Object properties" from the context menu.

The equation dialog, similar to when inserting, will appear to allow editing the expression.

## Read math equation

This section is mainly for screen reader users.

By default, the screen reader will announce "equation" and read the content of the mathematical expression as you navigate through the document.

If you do not hear the content of the mathematical expression, go to the Tools menu, open the Options dialog. On the "General" settings page, find and enable the option "Read image and math contents".

For long and complicated equations or for whatever reasons you want to read an equation in detail with hierarchical presentation, item by item, you can do that with the navigation mode.

At the equation, press Shift+F5 to turn on the navigation mode.

Press Tab to move between math formula and Braille output control.

Press Escape to close the navigation mode.

And here are some keystrokes used in the navigation mode:

- Move to the next: right arrow.

- Move to the previous: left arrow.

- Zoom out: up arrow.

- Zoom in: down arrow.

- Read the current: space key.

- Move to the start of the expression: home.

- Move to the end of the expression: end.

- Move back to the last position: backslash.

For the full list of keystrokes, please refer to the user guide from the Help menu.

## Set speech options

SMB supports reading equations with screen reader software in several languages other than the default English, and it also has options to choose how much information is spoken.

1. Go to the Tools menu and open the Options dialog.

2. Open the "Math equation" section and select the "Speech" settings page.

3. Press Tab to navigate to the "Speech language" field, and use the arrow keys to select the desired language for the screen reader to speak equations in.

4. The next tab is "Speech style"; choose the "Clear speak" style for more structured information.

5. Then, in the subsequent tab, "Speech verbosity", choose how much information the screen reader speaks.

Here we change from “medium” to “verbose”.

6. Then, activate OK button to save the changes.

## Set Braille Math Code

SMB supports translating equations into different Braille math codes such as Nemeth, UEB, CMU, and Vietnam. By default, the UEB math code is selected. To change the code:

1. Go to the Tools menu and open the Options dialog.

2. Open the "Math equation" section and select the "Braille" settings page.

3. Press Tab to navigate to the “Braille math code” and select the desired one.

Here we change from “UEB” to “Nemeth”.

4. Then, activate the OK button to save the change.

Now, let’s translate this equation into Braille and see how it’s written in Nemeth code. Press Control+T.