

Editing with MathType's TeX-syntax

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Introduction

MathType is well-known for its point and click user interface for editing math. However, the latest version adds TeX input from the keyboard, cut-and-paste, or drag-and-drop. This provides the user with the best of both worlds. When the user knows the TeX language for the math they want to create, they simply type it. TeX source can also be pasted into MathType, where MathType translates as much of the TeX input as it can, highlighting any TeX input that can't be translated. The user can correct the errors in the TeX code or simply replace it with math entered using the point and click interface. In addition to TeX source, images of formulas from Web pages that include TeX markup in the alt attribute of the element, can be copied and pasted or dragged into MathType, and the associated TeX source will be extracted and processed.

The dialect of TeX/LaTeX that MathType accepts is based on Texvc, the TeX variant used by Wikipedia and other wikis. This allows MathType to be used as a math input editor for Wikipedia authors. More importantly, it allows anyone doing research with Wikipedia to copy equations from its pages straight into MathType and then reuse them by pasting into Microsoft Word or PowerPoint documents, or any of the many applications MathType works with. Formulas entered as TeX can also be saved as GIF or EPS image files.

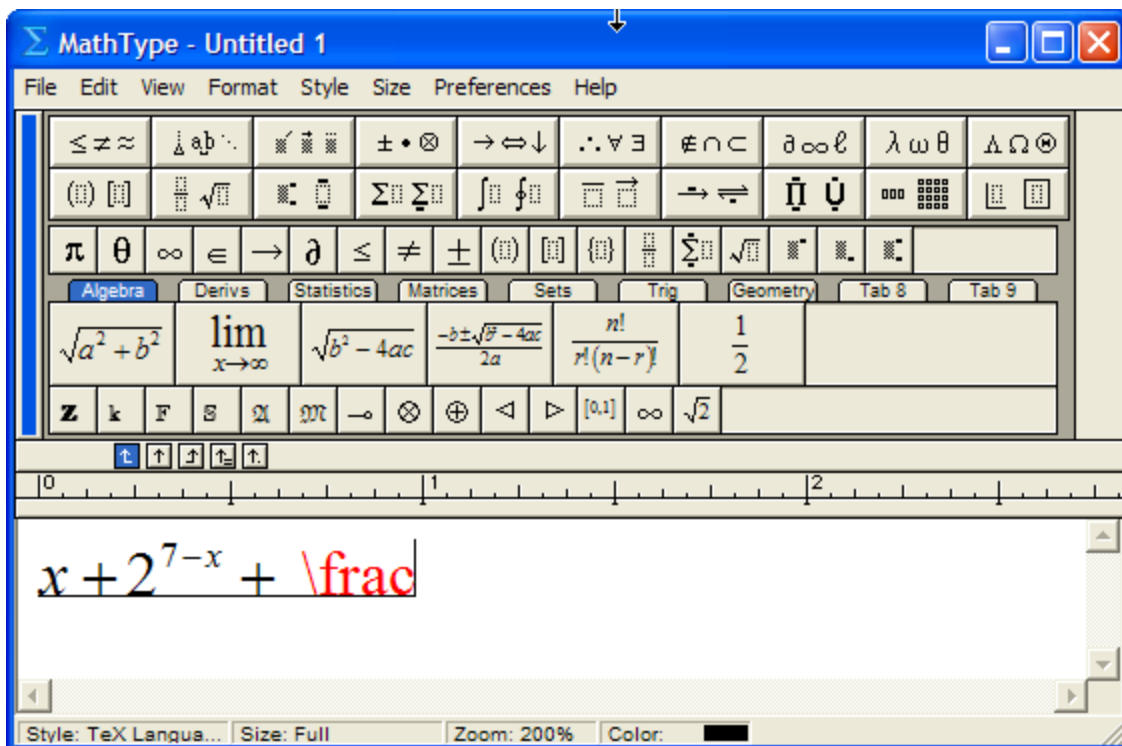
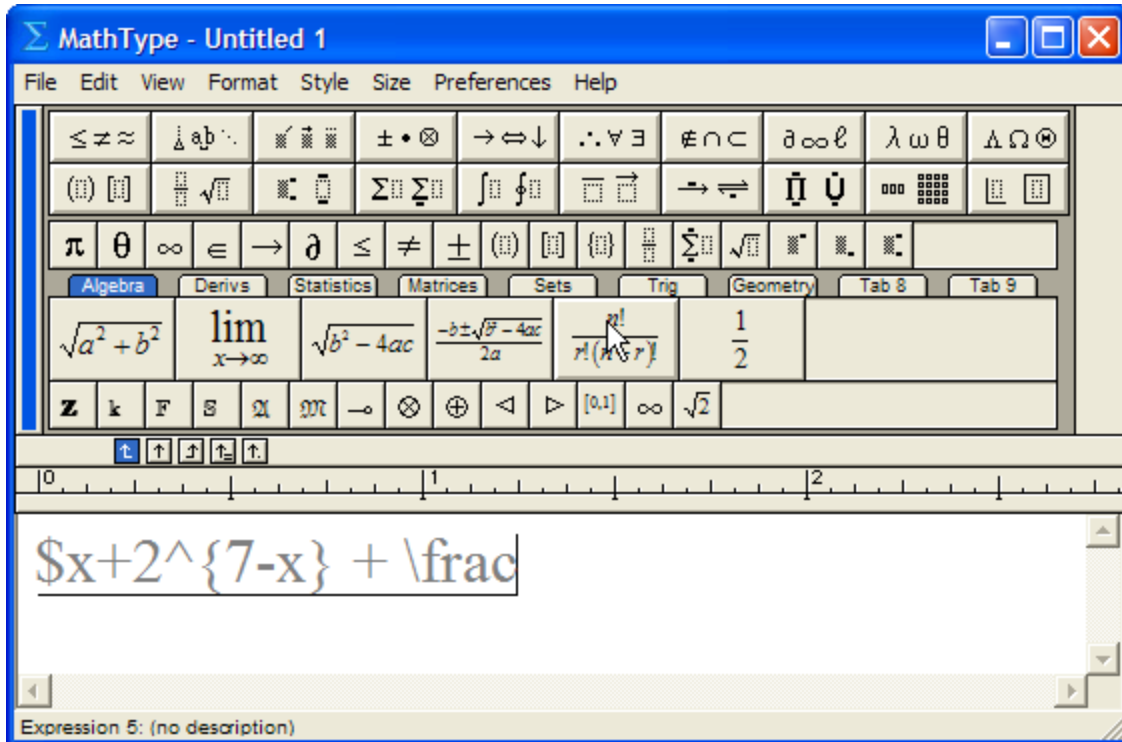
User Interface Details

TeX language input from the keyboard can be enabled or disabled via an option in MathType's workspace preferences dialog. By default, MathType ships with language input disabled for backward compatibility with existing user habits. However, the first time a user strikes one of the keys that would initiate language input mode if it were enabled, a dialog notifying the user of the option is displayed.

When language input is enabled, the '\$', '\', or '^' key will place MathType into language entry mode. Language input mode is indicated by a light gray font color, and the use of text spacing, rather than math spacing. Language entry mode is terminated by pressing the ENTER key. This causes MathType to process the input, which is replaced with typeset notation. Input that cannot be processed is turned red and left in place.

When a string of text is pasted into MathType from the clipboard, it is scanned for patterns that are highly indicative of TeX input, e.g. '\command' or 'expr ^ expr'. If they are present, the string is treated as language input, and processed. If one wants to paste a string such as 'a+b' into MathType and have it interpreted as TeX input, one must first initiate language input mode, e.g. by pressing '\$' and then pasting in the markup.

Below are screen shots showing MathType in language input mode, as well as the typeset result that is obtained by hitting ENTER. Notice the processing of the syntactically incorrect `\frac` command.



MathType 6 Input Language Processing and Error Output

When commands or syntactic constructions are not recognized by the input processor, the offending markup is typeset in red, and left unprocessed in place in the equation. When this happens, users have several means of correcting the problem available to them. In many cases, such as a mistyped symbol name, all that is required is to edit the bad name. When a user backspaces in red error output, it automatically switches back into language input mode. The user can press ENTER anywhere within the language input area to initiate reprocessing. In other common cases, such as mismatched braces, the result of processing will be several disconnected islands of error output. For example, input such as $\frac{x^2}{y^2}$ will produce this $\frac{x^2}{y^2}$ as output. Since language input areas must form a continuous region, it will not suffice to merely edit in the missing braces. In some cases, the user may prefer to merely delete the red error output, and proceed with graphic editing, e.g. insert a fraction template and drag the numerator and denominator into place. However, with longer TeX expressions, users may prefer to simply use CTRL-Z, which undoes the processing of language input, returning MathType to the state immediately before processing, with the original markup in a continuous input area. In the example above, this is preferable, since all that is required is the addition of a single '}' which is substantially less work than repairing the fraction via graphical editing. Of course, experienced TeX users will have a well-developed sense of which errors are difficult to track down in markup, and make their choice of correction method accordingly.

Use with Wikipedia

As noted above, MathType scans clipboard contents for likely language input. In the case of mathematics embedded in web pages, this can present a challenge. In practice, formulas are embedded in Web pages using many different techniques, and even for a given technique, different browsers put very different data on the clipboard for the same selection in a web page. Consequently, MathType 6 has been optimized for use with Wikipedia.

Wikipedia embeds mathematics in two ways. Very simple expressions are marked up directly as HTML using `<sup>` and `<i>` tags, along with Unicode characters for common mathematical symbols. More complicated expressions are embedded as images, with the Texvc markup for the image included in an alt attribute. MathType applies heuristics to detect both of these situations, and attempts to process the data as math input. Processing occurs when data is placed on the clipboard either via a cut or copy operation, or as the result of a drag-and-drop operation. While Wikipedia unambiguously identifies formula images via a class attribute, HTML math markup is not identified, and cannot always be identified with complete accuracy.

For users who also post to Wikipedia, MathType has long had a configurable output translator mechanism. MathType 6 adds a new, standard translator to Texvc. This allows users to paste equations from MathType as Texvc markup into the wiki editing area.

While MathType 6 is optimized for Wikipedia, many Web sites use the technique of including some dialect of TeX markup in alt tags. Consequently, MathType 6 can also be used with these sites with varying degrees of success, depending on how far their TeX dialects are from Texvc. Informal testing suggests that in practice, results are acceptable on many major math sites, such as PlanetMath.