Taking Math Notes in Obsidian: An Overview

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Introduction

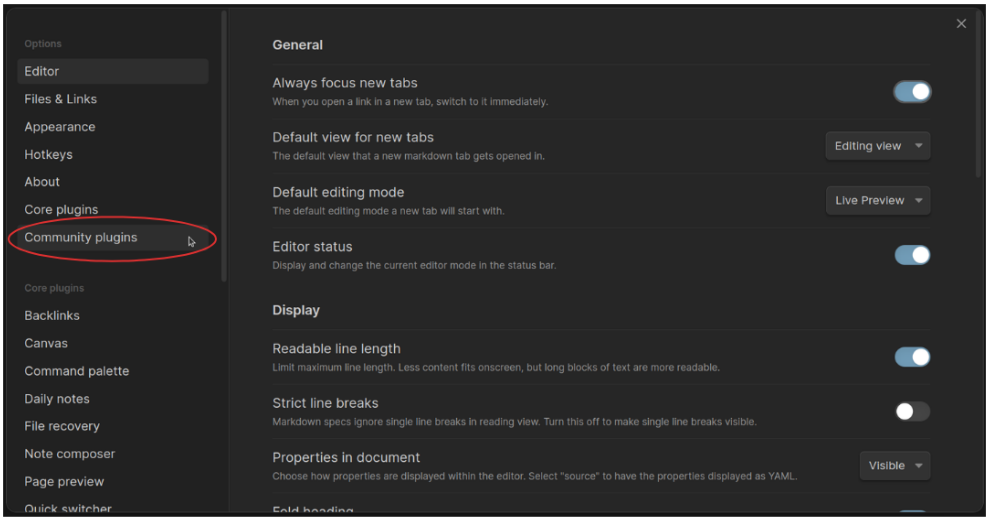
For the better part of a year and a half, I have been taking math notes in Obsidian. Obsidian is a markdown-based note-taking system, that allows one to uniquely customize their information-gathering process. In the time since I was introduced to Obsidian, I have devised a well-working methodology, allowing me to type LaTeX-based notes with visuals at the same speed as my lecturers(or sometimes faster). In this post, I intend to provide a general overview of how I do this, its benefits, drawbacks, and whether or not you may want to do something similar.

LaTeX-based Notes

Before getting started, I should state that taking LaTeX-based math notes are not a new idea. Anyone who has used LaTeX before has probably wondered if something like this would even work. In March of 2019, an article was published by mathematics student, Gilles Castel, detailing their process for using VIM/LaTeX to type mathematical notation in a quick fashion, suitable for lectures. This is likely the pioneering article that sparked this 'revolution' so to speak. However, while the notions discussed in this post are helpful, they aren't exactly user-friendly.

Why Obsidian?

Obsidian comes working right out of the box, and is fairly easy to grasp. You can learn all the basics you need from a single YouTube Video. On top of that, it's highly customizable, allowing one to craft the perfect system for their tasks. Customization comes from plugins, readily available with Obsidian's community plugins(you can find this under settings, then click browse).



I also enjoy that I can access my vault from just about anywhere, given I have an internet connection. One can sync their notes to the cloud using Obsidian's paid service or for free, using a GitHub repository. The benefit of doing something like this, is that one can view their notes on any device. I often review notes on my phone, before an exam, or lecture.

Plugins

I use the following plugins:

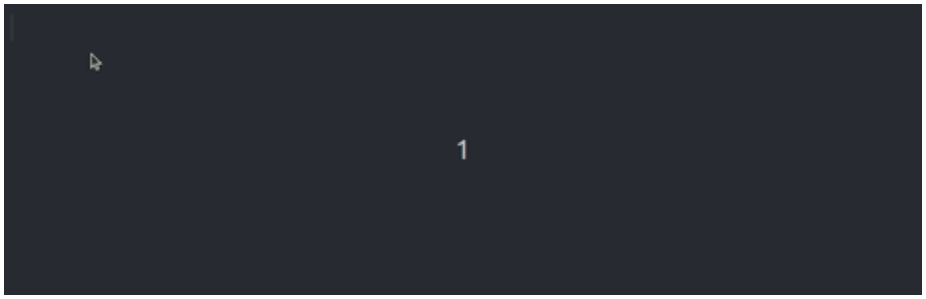
- LaTeX Suite
- Quick LaTeX for Obsidian
- Excalidraw
- Imgur Plugin (Optional)
- Desmos Plugin

Mathematics

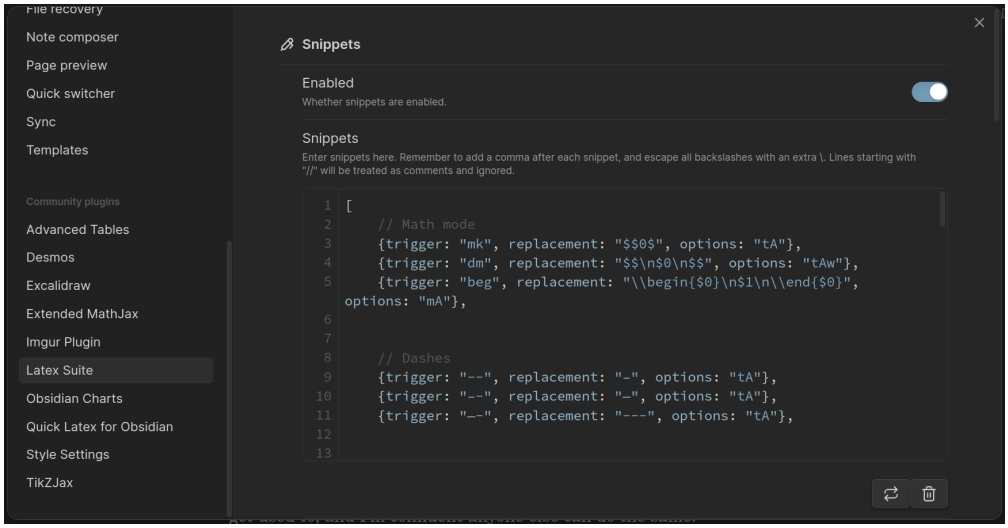
The main issue with typesetting mathematics is the time it normally takes to do so, only using a system like LaTeX. Writing in LaTeX takes time, and the documents don't render quickly at large sizes. Obsidian bypasses the rendering speed issue by using MathJax to display LaTeX code. Remaining still is the time it takes to type mathematical notation in a fast and effective manner. The solution lies in LaTeX Suite and Quick LaTeX for Obsidian. After enabling these plugins, one has access to snippets, which dramatically speed up the typesetting process.

For example, using a LaTeX block(`$$`), typing something like `int` directly translates to `\int  \, dx` and `1/` to `\frac{1}{}`. Typing things like summations,

matrices, and various mathematical symbols are also enhanced with the available snippets.



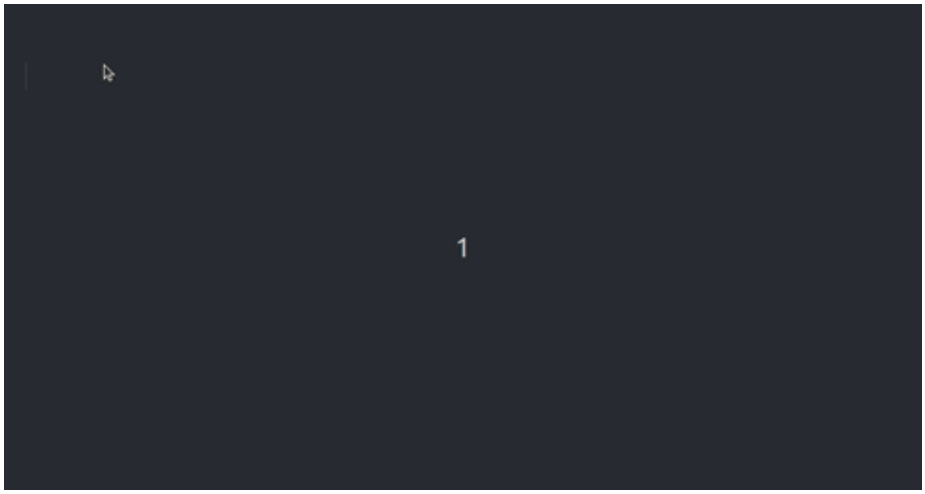
One can even add additional snippets by editing the document in Obsidian. This is not to say that the snippets readily available won't suffice for most general purposes. We can thank the github user, artisticat1 for putting together a lovely set of readily available snippets for this plugin. See here.



You'll want to mess around with and look through the LaTeX Suite commands in order to have a general idea of how to use them. My advice is to just start using them in lectures or however you intend to use them as soon as possible. Whenever you need to type mathematics, is when you should be practicing these plugins. They took me about a week to get used to, and I'm confident anyone else can do the same.

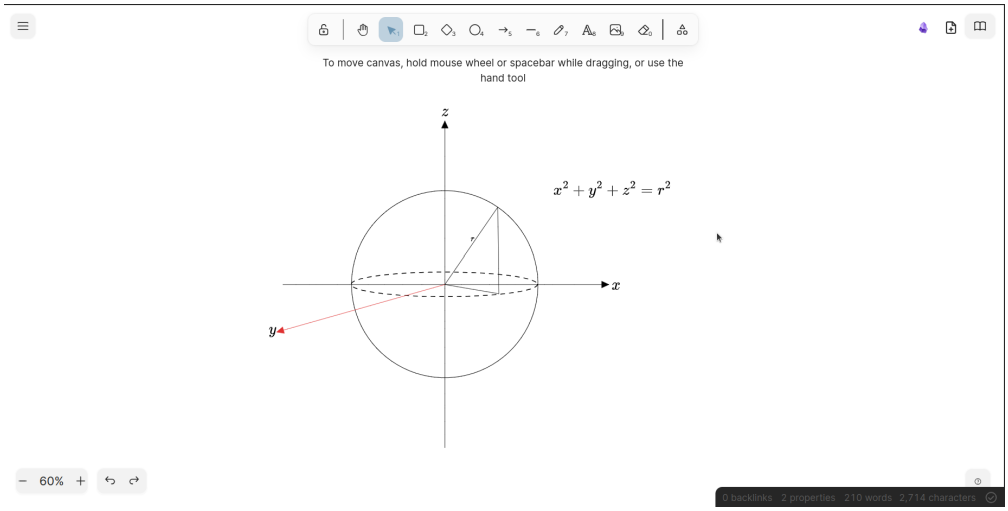
As a side note, I would like to expand on adding additional snippets to the document in Obsidian. For my differential equations course, it was often helpful to recall the form of common formulas like the laplace transform. My custom snippet generated the laplace transform from `lapl` which became `F(s)=\int_{0}^{\infty} f(t) e^{-st} t' \, dt` effectively displaying the

formula. I also added a way for me to generate representative $m \times n$ and $n \times n$ matrices rather quickly.



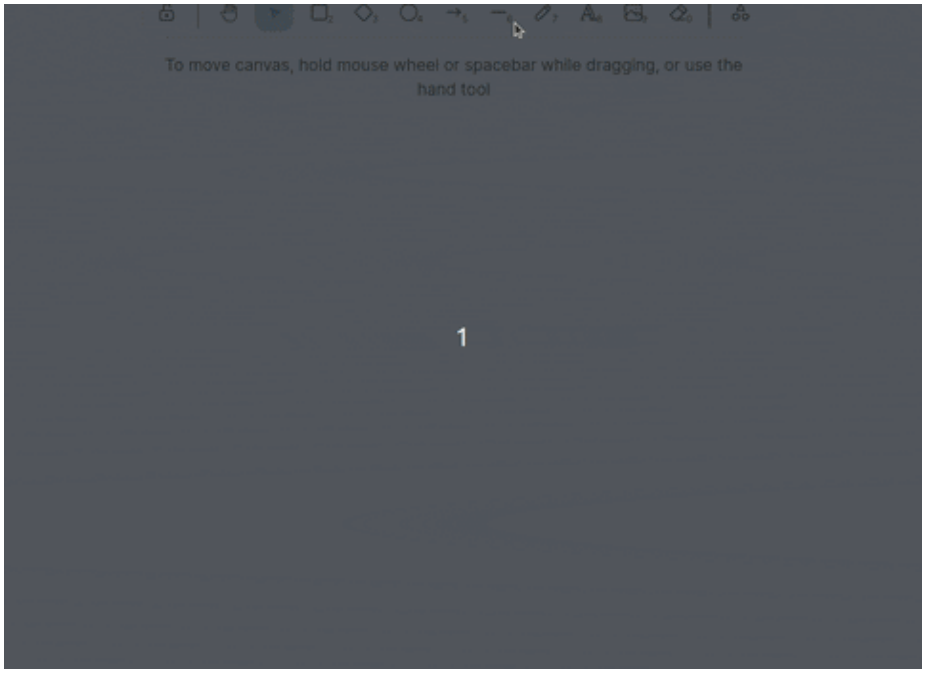
Visuals

A major component of my notes are the visuals applied in tandem to the mathematical language typed out. I make quick sketches in Excalidraw and paste them into the markdown document i'm working in. It's not the best drawing application, but it gets the job done. A nice aspect of Excalidraw is its ability to quickly and effectively render LaTeX code, allowing me to label items in my sketch. This is nice for making things like commutative diagrams and just about any other mathematical object.



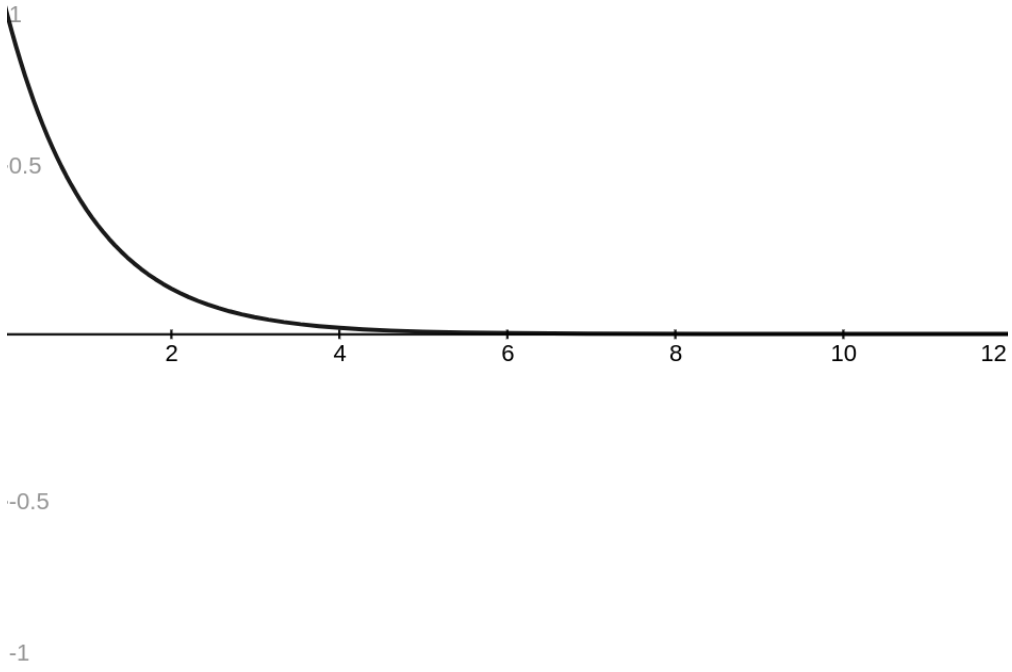
The Imgur Plugin converts anything copied to the clipboard to an imgur link,

which is helpful for saving space in one's vault. This is not a necessity, but if you are concerned about space, you might like having this option.



I occasionally use desmos to render quick graphs of equations as well. The editing of these takes place in a code block labeled `desmos-graph`. You can set the preamble above `- - -` within said codeblock. This allows you to set various parameters, such as width, height and axis orientation. Equations take a (you guessed it) LaTeX form, so it's pretty easy to copy and paste functions into the codeblock.

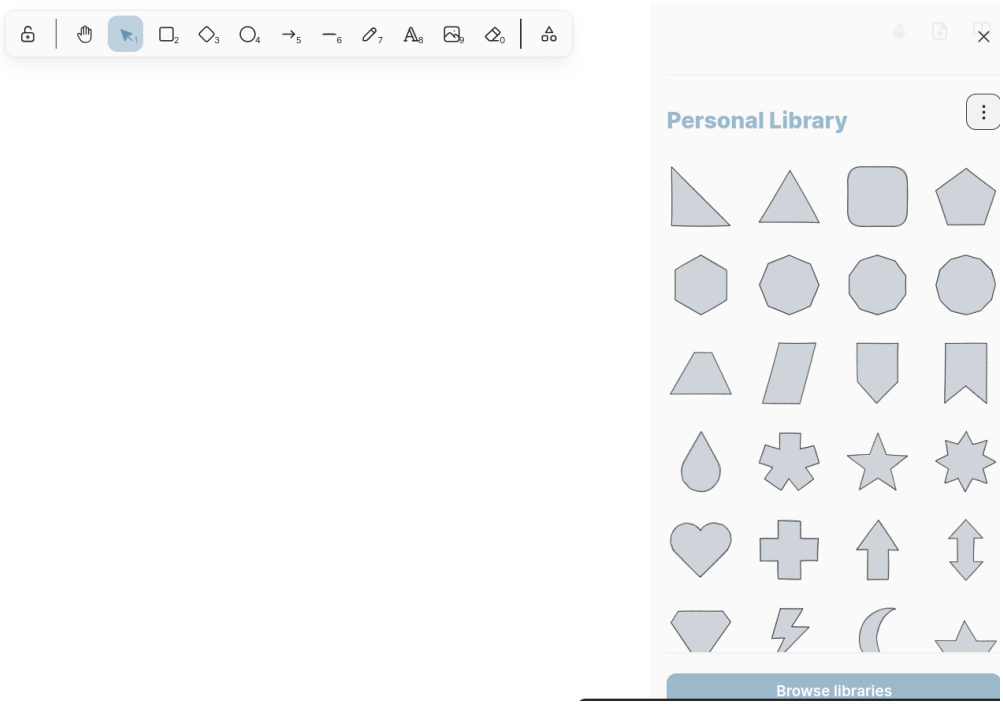
```
```desmos-graph
left=0; right = 12;
top=1; bottom=-1;
grid=false
---
y=e^{-x} | BLACK
```
```



Drawbacks

While I think typing math notes is most optimal for someone like me, it definitely has its disadvantages. Using something like LaTeX Suite requires one to memorize a laundry list of commands for effective use. This can seem like a hassle at first, especially if you're frantically trying to figure out something during a lecture.

Previously, I mentioned Excalidraw, the lightweight drawing platform that can be implemented within Obsidian. Some aspects of this plugin can be rather frustrating, especially when it comes to drawing simple shapes that should come with it, like triangles, and other polygons. Fortunately, you can import template shapes from custom library objects.



If you're anything like myself, you may want to export your notes as a pdf from time to time. Formatting can be a bit of a hassle in this realm, especially if you want nice looking documents. It's not impossible, but it may take some technical knowledge of CSS to get a 'clean' stylized document.

Conclusions

Obsidian provides a solid foundation for typing mathematical documents and notes. The speed and efficiency afforded by plugins like LaTeX Suite and Quick LaTeX, coupled with the visual clarity achieved through tools like Excalidraw and Desmos, outweigh the learning curve(in my opinion). Whether you're a student or an educator, using Obsidian could dramatically improve the way you engage with mathematical concepts. Give it a try!