

How to Read a Math Textbook

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Summary: Describes how to find specific information in a math textbook and how to read and work examples to better understand the material.

Learning Objectives: To name where specific information can be found in a math textbook. To describe how to read a math textbook effectively. To describe how to find help online and through tutors and professors.

Math can be a very hard subject to grasp, and some students stress out and fear math for many different reasons. If you are one of these students, stress and fear no longer, for this handout is designed to help you learn how to read a math textbook.

In this handout, we will cover how to find things in a math textbook, how to read and work examples for increased understanding, how to look concepts up online, and when to ask other people (tutors, teachers, etc.) for help.



How to Find Things in a Math Textbook

There are four major navigational tools used in math textbooks: the table of contents, headings, the index, and the glossary.

Table of Contents. The table of contents (typically at the beginning of the book) usually touches briefly on what each chapter and/or section is about. It can be used when you're looking to understand a medium to broad topic. Since tables of contents generally don't list any further information than section headings, looking up narrow topics in a table of contents can be difficult.

Headings. Headings within chapters, however, can help you find more specific information. For example, suppose I'm looking for the Rational Zeroes Theorem. I know it's related to synthetic division, but I have no idea how. I can look in the section on synthetic division and find the heading marked Rational Zeroes Theorem and find the section that will tell me about the Rational Zeroes Theorem.

Index. The index, which is typically located at the very end of the book, is an important tool in any college textbook. The index can be used to look up narrow or broad topics, although it's typically used for narrow to medium topics. The index is always in alphabetical order, so it's extremely useful when you already know what something is called. In the above example, I could find the exact page number(s) that the Rational Zeroes Theorem appear on very quickly by looking it up in the index. It should be



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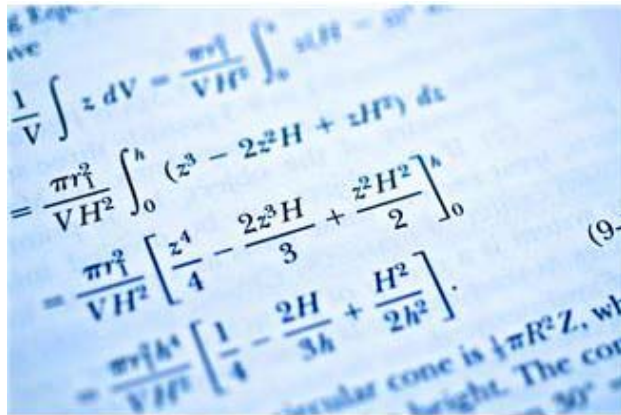
noted, though, that the index lists all occurrences of a particular term. So, if you're looking for an explanation of what something is or how to use it, the first one or two pages listed are typically the ones you want.

Glossary. The glossary, typically found right before the index, is also important in that it defines terms in alphabetical order. The glossary is particularly useful when an unknown term's definition uses terms which are also unknown. This is because you can simply flip to the other terms' definitions very quickly and without having to dig through chapters. The downside to the glossary is that there are no examples. So, you usually use it when you're unfamiliar with a term, instead of when you're unfamiliar with how to do something. Once you figure out what the definition means, you typically go to the chapter that talks about it and do some examples (often by looking the concept up in the table of contents or the index).

Formula Chart. Math books also have a great tool included at either the front cover or the back cover—the formula chart. This formula chart actually includes all of the formulas that you would need, such as the Pythagorean Theorem. This chart is especially useful when you are doing your homework and you know how to do the problems, but you need a reminder about what the formula looks like.

How to Read and Work Examples for Increased Understanding

In this section, we will talk about how to obtain information from math textbooks. Before we can obtain the information, we need to know what the information is about and what we don't already know about it. To do this, you can skim through the section(s) in question and circle terms, concepts, methods, or examples that you don't understand. This sets the stage for focusing on these things later.



After you've circled everything you wish to circle, you can start actually reading the chapter or reading assignment.

Any definitions, examples, or methods that you don't understand should be read multiple times (as many as you need). Sometimes you may have to read something several times to understand it.

Another thing you can do to increase your understanding before looking at the examples is to read the book out loud. Just like reading a paper

out loud can help catch mistakes, reading a textbook out loud can help you understand the concepts. Sometimes we just need to hear things, even if it's our own voice. This method is particularly effective for auditory learners.

If you've read something repeatedly and still don't understand it, try jumping to an example. Sometimes we learn more by doing than we do by reading about it. Go through each example, and don't move on to the next step of the example until you understand the previous step completely. In fact, most of the time, it's a good idea to write down the example problem and try to work it out, only using the example solution when necessary to get to the next step. The idea behind this is that you learn more by figuring things out yourself than you do if somebody (or something like a textbook) does it for you.

Once you understand all of the examples in a section or sections, try some of the practice problems (even if they aren't assigned). Pick problems whose answers are in the back of the book so that you know if you're on the right track. It's also a good idea to get the solutions manual for your textbook in



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case you run into a problem that just doesn't make sense (professors rarely require these, but they can help your understanding immensely).

Tip: When working practice problems, start with easy problems and work your way up to the most difficult problems. If you can do the most difficult problems in a section, chances are you'll know how to work similar problems on a test. Being able to work the most difficult problems will definitely help when it comes time to take an exam, or even do the homework.

Looking up Concepts Online and When to Ask for Further Help

If the examples don't make any sense and the textbook just doesn't seem to be helping, try looking things up online. There are several sites you can go to where you can look up math-related topics. Many might suggest Wikipedia. However, the math topics on Wikipedia can be difficult to read.

Another good resource for looking up math concepts is Google (just be careful to avoid the Wikipedia links whenever possible). Many universities and companies have websites that will explain anything from what a variable is to how to solve differential equations with 7 or more variables. In fact, this is sometimes the best source of all because you can find the same concept taught many different ways. Usually, at least one of these ways will explain it in a way that will make sense to you.

There are also tutors and professors who can help you when you don't completely understand problems. Remember, though, that you will not have these resources on tests. As such, it's a good idea to do as much on your own as possible. When you simply have no idea what to do after following all the above steps, that's when it's a good idea to see a professor or tutor. These individuals will likely understand the material already and have probably had training in how to present material to students. In addition, they've likely been taught the material and have taught the material themselves in different ways and can find the best way to explain it to you.



Tip: Typically, tutors will have a lot more time to work with you than professors. However, professors generally understand the material more because they've been working with it longer and have considerably more education and experience. Try to decide which would be more appropriate to go to. Don't worry, though! If you need additional help, you can always see either a tutor or a professor, whichever you didn't go to first.



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