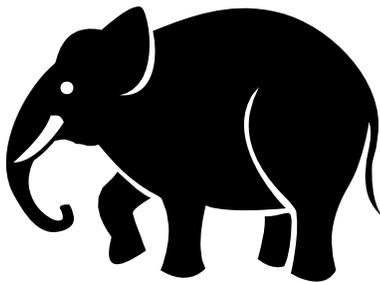


Algebra

One Bite at a Time



People say the way to eat an elephant is one bite at a time. This is the same with algebra. The new material needs to be in manageable segments with plenty of practice for each segment.

This text is for use as a first look at algebra for adults who don't think the alphabet belongs in math. This is intended for a full semester ABE pre-algebra course. Arithmetic review is integrated throughout.

Because I have found many students forget fractions during the time they study algebra, there are fraction practice problems in each section. Students shouldn't use a calculator on these problems. I don't teach or let them clear the denominators in this course. I do allow a calculator for many problems and exploration, but encourage paper and pencil practice on decimal and fraction problems.

There are many easy problems in each section followed by a few questions that belong in an introductory algebra course rather than in pre- algebra. Some students enjoy the challenge and a peek at their future in math courses reduces the fear of moving forward. However, these problems are not generally assigned.

I owe special thanks to Janet Barton for her English and Writing expertise. She helped make things clear. Thanks also to Jamie Kindred for answer keys and many other helps.

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1 Success in Math Class

How do you feel when you walk into a math class and the instructor reminds you of a timed exam scheduled for TODAY? Are you a little tense? Ok, maybe "tense" is not potent enough to describe the rising panic that keeps you from recalling information and answering questions that in another setting would be easy for you. Some students don't even need to have a test in a math class to feel that way. Some panic just hearing the words "Pythagorean Theorem." Some students may not have an emotional reaction, but they never understand why they haven't been successful in math classes.

Any student who can learn other subjects can learn math, even you. *Especially you!* If you haven't been successful in math classes in the past, pay particular attention to the following study tips to be successful in this class.

Register for the correct math class. Building a skyscraper with a weak foundation would be disastrous. Likewise, taking a math class without a proper foundation (knowledge considered prerequisite) will be disastrous. If you take a class that you are not ready for, you will face the possibility of failure no matter how hard you work. A failure will increase your dislike of math and possibly keep you from other important goals such as a degree or a job.

Register for the class suggested by a placement test or for the next math class in a sequence. A "C" in a math class might be an indication you are not quite ready for the next class. If you had a "A" or a "B" in the class, your foundation for the next class will be firm. Many successful students retake a math class to be certain they are prepared for the subsequent math class. Don't skip a class that is a required prerequisite.

Know the instructor. Meet your instructor, and learn her name. Also, help her learn your name. If you know each other, you will feel more comfortable asking questions in class, and the instructor will direct more of the lecture toward you.

Ask questions. It has been my experience that if one person has a question on homework or a lecture, at least three other people have the same question. As a graduate student I didn't understand a step in a process the instructor was talking about. I asked, "I may be the only one, but I don't understand ...". The lady beside me whispered, "That makes two of us." The gentleman behind me said, "Make that three." Even in higher-level classes, there are many who fear ridicule or embarrassment over asking questions. You must ask the questions you need answered to understand the material in spite of fear.

Know those around you. Get to know the students in your class. Find someone you can work with on homework. Discussing the material will increase understanding more than working problems in seclusion. A group of three or four is also a good idea. You gain a deeper understanding as you argue your point or explain why you would work a problem a certain way. You can also listen to a concept explained in a different way than the lecture. New viewpoints and wording can be very valuable.

It takes time. Math takes much more time to learn than other subjects. College classes take an average of two hours outside of class for every hour inside class. Some courses take less; math takes more. Some subjects require time to read the chapter, re-read notes before class, memorize terms and diagrams, and attend study groups. For a math class, you do all these in addition to working problems and comprehending concepts. Some time consuming study tips are:

Read ahead. Preview the material that will be covered. You may not understand all the points without the lecture, but you will have a heads up on what will be covered.

Re-write notes. As soon as possible after class, read through your notes. Clarify any concepts that are not written clearly. The longer you wait to go over your notes the more material will be lost because you can't decipher what you meant by the strange pencil scratches on the paper.

Review notes before class. Read the notes from the previous lecture. You will be better prepared for the next topic because in a math class the next topic will build from the previous one.

Do homework as soon as possible after class. The longer you wait the less you will remember. I have students tell me every semester, "It seems easy when you do it on the board, but then I get home and I don't understand any of it." If you only have fifteen minutes after class before you have to be somewhere else, do one problem from each type assigned to start moving your learning into a more permanent residence in your brain.

Math is more like learning the piano than learning history. You may understand the technique for a musical piece, but without years of practice, you won't be able to play. You must practice math daily. Understanding alone is not enough.

If your text has selected answers provided, work those problems and check the answers. If one is wrong, find out why. Knowing what didn't work is just as important as understanding the correct way of working the problem.

Rework example problems from the board and text. Write a problem from the notes or text on paper. Try to work the problem without looking at the given solution. Only peek if you get stuck. Sometimes a textbook leaves out steps. When you rework the problem, fill in any steps the text skips.

Get help. I spent many hours of my math study time in a math lab. I didn't always have questions, but someone was there to help if I did.

Some times you need a private tutor. If you get a tutor, direct your tutoring session. After a concept is explained to you say, "Now let me explain it back to you, and you tell me if I'm correct." Doing this will put the concept in your own words.

Visit with the instructor during office hours. The instructor knows exactly what he or she feels is most important and will guide you as you study these concepts.

Never miss class. If you do miss class, follow up in the math lab doubling the class time missed.

Math classes build from one day to the next. A concept taught on the day you missed will be used in the explanation the day you come back. Falling behind in math class is a sure way to fail.

Testing. Never cram for a math class. Start studying for the first exam on the first day of class. Work and rework problems. Re-read notes and text. Re-work a problem from each section each day. Sleep well and eat healthy before an exam. Practice calming yourself. Smile while testing because a smile will lower your anxiety level. Breathe deeply to calm yourself.

With the proper mathematics background, determination, dedication, help, and time you can learn mathematical concepts. You may even enjoy the patterns and puzzles found in many problems. Students sound so surprised when they say, "This is fun"; however almost all do enjoy getting hard problems right. After all the hard work, they see the results, feel smarter, and achieve something they may have thought impossible in the past.

Information in this section adapted from Cynthia Arem's Conquering Math Anxiety: Brooks/Cole, 2003 and Paul D. Nolting's Math study Skills Workbook: Houghton Mifflin Co., 2000.