

## STUDY TIPS FOR LEARNING MATHEMATICS

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### 1. Learn to Read your Math Book

Reading math for understanding is a skill that should be developed. Work at developing this skill in the beginning chapters of your math book. These chapters are likely to be easier for you to understand than the later chapters. The experience of reading the early chapters should make the reading of the later chapters less difficult.

Your first reading should be done before your instructor lectures. Read through the material just to get an idea of what it is about, realizing that you are not going to understand everything. Then re-read it after your instructor has lectured – not only once – but as many times as necessary for complete understanding. Allow time intervals between readings and try to understand at least one more thing each time you read. Take advantage of your sense of touch by using a pencil when you read. Write down the important things and check the calculations. Using a pencil will help keep you awake and what you write down will be of value to you later.

### 2. Keep a List of Definitions, Rules, Theorems, and Procedures for Problem Solving

These important things can be written as you read the book. Start learning them as you write them. Try to understand why each rule works because this makes remembering it easier. Do not merely memorize symbols; verbalize the rules so that you know what it says. Learn the rule in symbols and also in words. Know how to use some of the rules forward and backward. For example, the distributive principle,  $a(b+c) = ab + ac$ , is used backward  $ab + ac = a(b+c)$ , as often as forward.

If a particular kind of problem is difficult for you, writing down a step-by-step procedure for solving it can be helpful. This procedure should be written verbally and should be followed by an example using symbols.

If you like being organized and are ambitious, try using 3"x5" file cards. Put the important information on the front and work examples on the back. These cards should be particularly helpful when reviewing for the final exam.

### 3. Take Notes in Class

Copy everything that your instructor writes on the chalkboard, but don't merely copy, intending to understand it later. Concentrate on what your instructor says, trying to follow his thinking and computation as you copy. Reading the lesson prior to going to class not only helps, but is often absolutely essential. When you don't understand something, ask a question! If you try to keep up with your instructor, you'll find that you can ask questions without appearing to be stupid, and your classroom experience will be more meaningful. You will be learning in class, and the work you do after class will then reinforce that learning.

Have a partner in class with whom you can compare notes. Possibly what you missed he/she will have gotten. In addition, if it is necessary for you to be absent, you can rely on your partner's notes.

Review your notes soon after class, as well as frequently thereafter, with time intervals in between. Remember that you learn through repetition.

4. Do your Homework Regularly and as soon after Class as possible. Use a Pencil With an Eraser Before starting your homework familiarize yourself with the definitions, rules, and theorems that apply. Study all the examples that are worked in your text. Work at your assignment until it is completed. When you are unable to work a problem:
  - 1) Look for a similar example done in your text
  - 2) Compare it with a simple problem – try to make one up – or
  - 3) Ask yourself what rule applies.

Have a homework partner so that you can compare your answers to his/hers if your book doesn't give answers. Also, with the help of your partner you may be able to work problems that you cannot work on your own. If you do the entire assignment with your partner, be sure that one of you isn't doing all the thinking. It's important that each person experiences the thought process required in the solution of the problems. Don't get discouraged if you help your partner more than he/she helps you. Through helping others you will gain a better understanding yourself and will also increase your retention of that understanding.

Look for consistency in your errors and be on the alert to avoid the same kinds of errors on a test. Punish yourself for making "stupid mistakes" by making up and working ten similar problems.

Be conscious of the time it takes you to do your homework. Work as quickly as you can, trying to avoid any distractions. Look for and use shortcuts because they are time-savers. If you practice working quickly while doing your homework, you should have no difficulty completing a test in the allowed time.

In all your work, your goal should be to do the problems without thinking the rule. For example, when doing operations on negatives you can respond (hopefully) without thinking any rules. However, until you reach this stage, make it a habit to think the rule.

## 5. Allow Sufficient Time to Review the Tests

If you have read your book, have kept a list of “things to know,” have studied your notes frequently, and have done all your homework regularly, you will find that you are fairly well prepared for a test and will not have to devote hours to a last minute preparation.

Here are some suggestions on reviewing:

- 1) Be sure that you have a working knowledge of all definitions, rules, and theorems.
- 2) Know the step-by-step procedure for solving all the types of problems for which you are responsible.
- 3) Re-read the text and your notes.
- 4) Work some of the examples in the text without looking at the solutions. Then compare your solutions with the correct ones.
- 5) Work every kind of problem for which you are responsible, but do only those for which you know the correct answers.
- 6) Get a sufficient amount of sleep the night before the test to assure your ability to think clearly and quickly, thereby avoiding needless mistakes.

## 6. Use Good Test-Taking Techniques

- Take pencil with an eraser
- Relax. If you have done “everything,” then you should be able to show your instructor that you can do what he expects you to do.
- Survey the test quickly and work the easy problems first. Doing the hardest problem last will prevent your spending too much time on it. Also, if a problem is likely to put you in a state of frustration, it’s best for that problem to be the last one.
- Work quickly, but don’t sacrifice accuracy for speed.
- Do your work in a neat and orderly manner, so that you can quickly check through each problem after you have completed the test. Plan to allow at least the last five minutes to do this final checking.

In conclusion, here are some do’s and don’t’s:

- **Don’t** neglect your work in the beginning of the course. The content of a math course is accumulative. **Do** learn the content of the beginning chapters very well, so that success in the later chapters is possible.
- **Don’t** expect overnight miracles. Learning with understanding takes place over a period of time and through repetition. **Do** start reading early, get your work done on time, and review frequently.
- **Don’t** let your math course be a constant source of frustration. Learning can be enjoyable when you are in control of the subject. **Do** try everything possible to get on top of the subject and stay there.

Who knows? You may discover that learning math is fun!