

## OVERCOMING MATH ANXIETY

Many people have trouble learning mathematics because they never develop the particular study habits which are conducive to success in mathematics. If you practice the following suggestions they should prove invaluable to you.

### 1. CHOOSE A GOOD ATTITUDE

Decide that you are going to do your mathematics in the most successful way possible and choose a good attitude to accompany your efforts. Many students don't realize that this choice is even available. Never tell yourself, that you can't do, you're too dumb, or not smart enough. These types of thoughts are self-defeating and only create frustration and anxiety. Therefore, be positive, yet realistic, practice and review those problems, formulas, and vocabulary that are difficult for you. Remember "Perfect Practice Makes Perfect."

### 2. READ CAREFULLY AND DELIBERATELY

The way you should read a mathematics book is quite different from the way you read a history book, a newspaper, or a novel. In mathematics you must read slowly, absorbing each word. It is sometimes necessary to read a discussion or problem many times before it begins to "make sense" to you. In some types of reading, such as a novel, it is desirable to skim and read rapidly, because there are usually a few thoughts "sprinkled" among many words. However, in reading mathematics, each work or symbol is important because there are many thoughts condensed into a few statements. It's also very important to learn and understand mathematical vocabulary and terminology as well as being able to actually solve mathematical problems.

### 3. THINK WITH PENCIL AND PAPER

Have pencil and paper ready to use them when you read and study mathematics. Test out on paper the ideas that the authors are discussing. As you read the chapters in your math book and look at the examples that are given, it is very helpful to actually work through the example problems before you work the problems in the exercise. When the book proposes a question, try to answer it before going on. Do as much as you can on your own. This will help to clarify the ideas and procedures in your mind before you start the exercises. After you have read and reread a problem look carefully, if you still don't see what to do, don't just sit and look at it. Get your pencil going on scratch paper and try to "dig it out." Many times you are able to solve the problem by working it out. If, in attempting to solve a problem, you have nothing written on paper, then certainly you have not yet exerted enough effort to justify seeking help.

4. **BE INDEPENDENT**

Try to complete each lesson without assistance. If you seek help needlessly, either from your tutor, classmate, or math learning center, you will not gain the maximum benefit from your work. It takes exercise to become strong. You cannot do it through someone else's exercises. However, you must ask questions when necessary. Sometimes little things cause considerable confusion. Do not be afraid that your question may sound "stupid." The only "stupid" action is to fail to ask about a topic you have really tried to grasp and still do not understand. Some people seek help too soon, and some wait too long. You will have to use good common sense in this matter. Learn what you can about your own particular learning style.

5. **DISCUSS IDEAS AND CONCEPTS**

Discuss math ideas on a regular basis with your tutor, or a friend. Better yet, try teaching a particular idea to another student. Explaining something to someone else is often the best way to learn it. Sometimes you will have a "feeling" about a problem or procedure that you can't explain, but you know it's correct. That's OK, too.

6. **PRESEVERE AND TAKE TIME TO REFLECT**

Do not become frustrated if a topic or problem completely baffles you at first. Stick with it! An extremely interesting characteristic of learning mathematics is that at one moment the learner may feel totally at a loss, and then suddenly have a burst of insight that enables him or her to understand the situation perfectly. If you don't seem to be making any progress after working on a problem for some time, put it aside and attack it again later. Many times you will then see the solution immediately even though you have not been consciously thinking about the problem in the meantime. There is a tremendous sense of satisfaction in having been persistent enough and creative enough to independently solve a problem that had given you a great deal of trouble.

To learn mathematics well you must take time to do some reflective thinking about the material covered during the last few days or weeks. It takes time for some ideas in mathematics to "sink in." You may have to live with them awhile and do reflective thinking about them before they become a part of you. You must continue to use such concepts to "keep" them.

7. **CONCENTRATE ON FUNDAMENTALS AND LEARN THE VOCABULARY**

Do not try to learn mathematics by memorizing illustrative examples. In order to truly learn math, you must know and understand mathematical rules, formulas, vocabulary and concepts. If you don't learn mathematical concepts, you soon become overwhelmed by trying to memorize math problems, and the further you go, the less successful you will be. All mathematics is based on a few fundamental principles and definitions. Some of these must be memorized. But if you concentrate on these fundamentals and try to see how each new topic is just a re-application of them, very little additional memorization will be necessary. It may be helpful whenever you come across a new word in the text to:

1. Write the word on a note card.
2. Write the meaning of the word on the back of the card.
3. Practice writing the word, reading the definition, and using the word in some sentences.
4. Set up a definite study time for reviewing new vocabulary words.

8. **BE NEAT AND ACCURATE**

Being neat and accurate are habits that will prevent many “headaches” in any field of endeavor. Everyone must deliberately practice neatness and accuracy before they actually become a habit. Keep your work neat and organized. Try to organize the material as if it were intended for the printer. Have a special section in your notebook for mathematics. Keep today's homework paper in the same place in this section every day so you can turn to it immediately.

9. **TAKE TIME TO DO YOUR HOMEWORK AND DO IT ON TIME**

You must do your homework regularly and make up the work missed when absent. Mathematics is built vertically, like a tall building in which the upper floors are supported by the lower ones. You cannot afford to leave gaps in this important foundation. If you don't learn and understand step number one, it is extremely difficult to go on to step number two. Do not wait until the last minute to do your work and they rush through it. If you spend just enough time on your lesson to get the “answers” and do not take time to really understand the underlying principles, you will soon become frustrated and confused. In doing your homework exercises, be aware of the reasons for the steps you go through. Mathematics is a lot of fun as long as you are “on top of it” and understand what is going on; otherwise, it is very frustrating.

Learning mathematics is not an activity for the intellectually lazy. It requires a strong, steady effort. There is no other successful way. Neither is mathematics a spectator sport; you must become very actively involved. Do not expect to sit idly

by and watch your teacher do the work. This might keep your teacher in good math condition, but it won't do you much good. It is easy to be fooled into thinking you don't need to practice because it looks easy for the teacher. Remember that when the instructor is making explanations he/she is thinking out loud for you. Also an instructor has had years of experience with math and usually prepares the lessons they plan to go over in class, days in advance. You need to take time in your own study to think and solve as many exercises as you can, this creates understanding, learning, and proficiency. Don't skip days in between practice. It's best to practice your math every day. The skills you learn are soon forgotten if you don't practice on a regular and routine basis. Don't forget that the main objective of the written homework is to learn the ideas of mathematics by putting them into practice. Sometimes the written homework also has the objective of showing how much you have learned.

There will be no extra compensation given for working hard or for conscientiously doing your homework. This is something you are expected to do. The "reward" you get will be the mathematics that you learn and the feeling of satisfaction you gain because of the learning.

## AUXILIARY SKILLS: TAKING A MATH TEST

1. **BE WELL PREPARED** – comfortable, rested, and well fed.
2. **READ INSTRUCTIONS** – Upon receiving the test, read or listen to introductory instructions and/or corrections. **Scan the test** – familiarize yourself with overall content.
3. **DO THE EASY ONES FIRST** – Proceed through questions first answering those you feel confident you can do. This achievement will boost your spirits. Circle those you skip to make sure you don't overlook them in the end. Make sure your answers are clear and complete. After you do the easy ones and the ones you know, then go back and complete the difficult and/or lengthy problems.
4. **TO OVERCOME TEST ANXIETY** – or blocking, spend 5 minutes relaxing, breathing deeply and steadily, without thinking about the test. Concentrate on relaxing your whole body. When you think you are ready to proceed, go back to step 3. Action reduces anxiety. If you get to a problem that you can't solve or don't understand, go on to another problem. The longer you sit staring at the problem, the more nervous, anxious, and upset you will become.
5. **PROOFREAD** – Always proofread all answers. Check your work and make sure you have not made careless mistakes that can cause you to lose valuable points. Check answers by reworking each problem or use the “balance” method. For example:  $12 - 6 = 2$  and  $6 \times 2 = 12$  When using a balance method your answer added, subtracted, multiplied or divided should give you your original problem. If it doesn't, then you know you did something wrong.

## WHEN YOU GET STUCK

1. Think of every formula or definition that might be relevant to the problem. Write them down. If you are concerned that you might forget formulas, write them down as soon as you get your test. If allowed, write the formulas directly on your test, if not allowed, then write them on your scratch paper. Now your mind is free to concentrate on solving the actual problem instead of worrying about forgetting a formula.
2. Work backwards; ask yourself, “What do I need to know in order to get this answer?” And relate problems to similar examples from your textbook or notes.
3. Solve a simpler case of the problem using large or small numbers, then follow this example like it was an example from the text.
4. Break the problem into simpler problems. Work part of the problem and see if it relates to the whole.

5. If you are making NO progress, go on to another problem on the test and return to the ones you skipped later.

## TAKING MATH TESTS

The following are some “hints” for taking math tests. . . .

- I. **GETTING READY. . .** Your performance on any test is the result of your **preparation**. The better prepared you are, the more **confident** you will feel. **Anxiety**, usually the result of non-preparation and lack of confidence is known to **block** performance and result in poor test scores.
  - A. **Budget:** a little extra time, at least 10-12 days in advance of the test. It makes learning easier and you’ll feel better prepared. This tends to greatly reduce test anxiety.

**Avoid Cramming:** Cramming, the act of “pulling an all nighter,” to stuff one’s brains – usually leaves you so tired and fatigued, your ability to concentrate is effectively blocked.

**Always get a good night’s rest before the test!**
  - B. **Stimulate test conditions:** Math is one subject that will let you stimulate the testing condition. **Homework problems** are excellent simulators (once you have mastered the subject).
    1. Divide the expected number of problems by the length of time for the test. This gives you an “average time” to work a test problem.
    2.  $\text{Number of problems} \div \text{time limit} = \text{average time needed to complete the exam.}$
    3. See if you can correctly solve a problem within the time limit. The idea is to **increase** speed without losing **accuracy**.
  - C. **Find a copy of an old test:** All teachers have their unique “testing style.” If you can anticipate the questions, you enhance your chances of success.
  - D. **Talk to another student who has taken the course.**
  - E. **Consult another textbook:** You don’t have the “gospel truth” for a textbook. Perhaps another author will make you see the light.

- F. **Form a study group** (of two to four dedicated students). Always review what you're going to discuss before you get to the study group. This will help ensure that you actually discuss the math and not other topics. Make sure that you can solve problems outside the group as well as when you're in the group.

## II. **TAKING MATH TESTS**

1. Make sure you **understand the instructions**. There is nothing worse than providing an excellent answer to the wrong question.
2. **Inspect each problem** to 1) List all facts, 2) Identify the question(s) and 3) List all relevant formulas.
3. **Be clear in writing** each step of the solution. This makes rechecking easier.
4. **Perform each step carefully:** Take care in computing the steps.