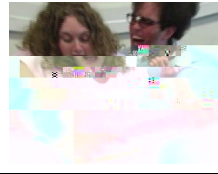


How to Overcome Math Anxiety



“Do not worry about your difficulties in mathematics; I assure you that mine are greater.”

-Albert Einstein

The video *High Anxiety of the Math Variety* was created by a group of Anoka-Ramsey Community College faculty and students. We hope you found the video both informative and entertaining. It was developed to create awareness about math anxiety and to introduce students to some of the causes and symptoms of math anxiety. The video also provides some basic self-help techniques. Math anxiety is a complex problem, however, and many students would benefit from more information and guidance than this video can provide. This supplement to the video is intended to expand upon some of the information provided in the video and to offer resources where students (and instructors) can get more facts about, and help with, math anxiety.

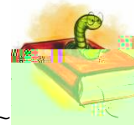
What Is Math Anxiety?



One definition of math anxiety is “the panic, helplessness, paralysis, and mental disorganization that arises among some people when they are required to solve a mathematical problem”. (Source: Tobias and Weissbrod (1980)). Math anxiety is a serious and pervasive problem, especially in the community-college setting. Students may experience math anxiety in many forms and degrees, from “freezing up” during a math exam, to attempting to avoid anything having to do with numbers. Symptoms may be physical or psychological and may include (but not be limited to) any of the following:

Physical

This "vicious cycle" may lead students to delay or stop taking math courses which often limits their educational opportunities. In today's increasingly technical society, it is more important than ever for students to have knowledge of math. According to Frances Rosamond of National University, "Starting salaries go up \$2000 per year for every mathematics course after the ninth grade." A recent *Business Week* article states "the world is moving into a new age of numbers...just look at where the mathematicians are now. They're helping to map out advertising campaigns, they're changing the nature of research in newsrooms and in biology labs and they're enabling marketers to forge new one-on-one relationships with customers. As this occurs, more of the economy falls into the realm of numbers." (Source: *Business Week*,



~ Myth One – You have to be born with a mathematical brain ~

People who are successful in mathematics aren't usually born that way. Learning math, like learning in general, takes knowledgeable teachers, willing students, and, most importantly, a great deal of time and practice. Learning math is, in fact, much like learning a language. The symbols and notation make up the rules of grammar and the terminology is the vocabulary. Doing math homework is like practicing the conversation of math. Becoming fluent (and staying fluent) in math requires years of practice and continuous use.

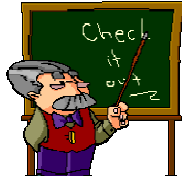


~ Myth Two – You can't be creative and be good at math ~

Can you be an artist, writer, or musician and be good at math too? Yes! Math is found throughout literature, art, music, film, philosophy, and is essential to many "creative" fields. Leonardo DaVinci, Mozart, M.C. Escher,

would be many more high-achieving girls and women in mathematics. (Author's note: I was never really encouraged in math in high school. Not because I wasn't good at it but because it wasn't traditionally something that girls excelled at. Fortunately, I found the encouragement and support to go into math in college (it was a women's college) – NSB).

For more discussion of this math myth, check out the Association for Women in Mathematics website: <http://www.awm-math.org/>



Ten Ways to Reduce Math Anxiety

the concepts better and be able to apply them in many different types of problems (not just ones you've seen before).

9. Find a support group.

A support group is especially helpful for adults with math anxiety.

10. Reward yourself for hard work.

After completing a difficult assignment or an exam, it's time to give yourself a break. Have a chocolate... or a party!

There are, of course, many more strategies that can help with math anxiety. Check out these websites for more self-helps techniques:

<http://www.mathpower.com/>

http://www.trumbull.kent.edu/academic_services/tutoring/strategies.cfm

Note: The suggestions listed above are a good way to start to work on overcoming the fear associated with math, but, since students may suffer from different levels and forms of anxiety, students may also want to consult their instructors and counselors to get guidance on an individualized program of dealing with math anxiety.



Studying Mathematics

"If you care at all, you'll get some results. If you care enough, you'll get incredible results."
– John Rohn (Author and motivational speaker)

"No one has ever drowned in a sweat."
– Lou Holtz

"The most practical, beautiful, workable philosophy in the world won't work – if you won't."
– Zig Ziglar

Sometimes good study habits can be the key to overcoming math anxiety. Some students do not realize how important studying skills are. The following material contains tips on how to study mathematics at home and in class, how to prepare for tests, how to take tests, and how to use your time studying the most efficient way.

1. How to Plan Your Time

(Source: Supplementary Packet assembled by Barb Schewe, Anoka Ramsey Community College)

Is your credit load realistic with respect to your other commitments? The following chart will help you determine the number of hours you need to study every week.

School vs. Work vs. Home/Family

12 credits/hours in class

+ 24 hours of study time outside of class

36 hours needed for college per week

You may want to limit your number of credits if any of the following apply:

- you have a job
- you are the primary caregiver for children or have many family responsibilities
- you were recommended to take a writing and/or reading course
- you are concerned about the amount of time one or more of your classes will take

3. How to Study in Class

Be ready for the lecture: Have the homework done. Look through the chapter which will be discussed next, it helps to be more comfortable with the new material.

Have everything you might need for the math class ready: pencil, eraser, graph paper, calculator, textbook, and your notebook.

Ask questions every time you don't understand something. Don't wait until later, new material is usually based on the previous chapters.

4. How to Prepare for Test

The best way to prepare for the test is to do the homework when it is assigned. Practice every day; don't try to learn everything in one night before the test date.

Writing the summary of the main concepts and formulas helps a lot. Make a cheat-sheet even though you will not use it on a test.

Ask your teacher questions if you do not understand or remember something. Try to do it ahead of time; there might be many students who need help right before the test.

Solve every type of problem you had in the homework or test review problem set.

Get plenty of rest before the test. Don't study all night. Get lots of sleep instead.



5. How to Take a Test

"When you're prepared you're confident. When you have a strategy, you're comfortable."

– Fred Couples (professional golfer)

(Source: Department of Mathematics, Saint Louis University, <http://euler.slu.edu/Dept/SuccessinMath.html>)

- First look over the entire test. You'll get a sense of its length. Try to identify those problems you definitely know how to do right away, and those you expect to have to think about.
- Do the problems in the order that suits you! Start with the problems that you know for sure you can do. This builds confidence and means you don't miss any sure points just because you run out of time. Then try the problems you think you can figure out; then finally try the ones you are least sure about.
- Time is of the essence - work as quickly and continuously as you can while still writing legibly and showing all your work. If you get stuck on a problem, move on to another one, you can come back later.
- Work by the clock. On a 50 minute, 100 point test, you have about 5 minutes for a 10 point question. Starting with the easy questions will probably put you ahead of the clock. When you work on a harder problem, spend the allotted time (e.g., 5 minutes) on that question, and if you have not almost finished it, go on to another problem. Do not spend 20 minutes on a problem which will yield few or no points when there are other problems still to try.
- Show all your work: make it as easy as possible for the Instructor to see how much you do know. Try to write a well-reasoned solution. The instructor might assign partial credit based on the work you show.
- Never waste time erasing! Just draw a line through the work you want ignored and move on. Not only does erasing waste precious time, but you may discover later that you erased something useful (and/or maybe worth partial credit if you cannot complete the problem). You are not required to fit your answer in the space provided - you can put your answer on another sheet to avoid needing to erase.
- In a multiple-step problem outline the steps before actually working the problem.
- Don't give up on a several-part problem just because you can't do the first part. Attempt the other part(s) - if the actual solution depends on the first part, at least explain how you would do it.
- Make sure you read the questions carefully, and do all parts of each problem.
- Verify your answers - does each answer make sense given the context of the problem?
- If you finish early, check every problem (that means rework everything from scratch).



The Math Anxiety Bill of Rights

(Source: The Math Anxiety Bill of Rights by Sandra Davis, in Donaday & Auslander (1980) Resource Manual for Counselors/Math Instructor: Math Anxiety, Math Avoidance, Reentry Mathematics)

- I have the right to learn at my own pace and not feel put down if I'm slower than someone else.
- I have the right to ask whatever questions I have. *(And I had better ask them. Which makes you feel worse: to ask a stupid question or to fail an exam?)*
- I have the right to need extra help.
- I have the right to ask a teacher or tutor for help.
- I have the right to say I don't understand.
- I have the right not to understand. *(When I am at the end of my rope from frustration I will call on the people who love and understand me to give me pep talks).*
- I have the right to feel good about myself regardless of my abilities in math. *(It's not like there's nothing I do well. I have my own place(s) where I have confidence and skill. I am more than who I am in the math classroom).*
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