

Math Anxiety

Are you anxious?

Symptoms can be physical – perspiration, increased heart rate, shortness of breath, upset stomach, tense muscles, or headaches. Symptoms can be thoughts and emotions – despair, fear, frustration, anger, or negative thoughts.

You are not alone

Many college students have math anxiety and worry about not being able to get where they want to go, in terms of a degree, because of math requirements. Depending on what is used to define “math anxiety”, 1/3 to 2/3 of adults qualify. It is hard to overcome a fear if you don’t really understand what the fear is or where it comes from. Once you identify the fear, then you can work on dealing with it! Helping you to get over your math anxiety is the goal of everything that follows.

Recognize where your anxiety comes from (Why you are anxious)

1. **Past experience** – It could have been a particular course/teacher/incident, or just a general feeling developed over time due to any of the following situations.
 - a. Someone (teacher/classmate/family/friend) made you feel embarrassed about a question you asked, or an answer that you gave, or about a grade you received.
 - b. You got frustrated with yourself over your performance on a test (or tests) even when you felt like you knew the material.
 - c. You got frustrated with what you thought was your inability to understand the material. This can be for a number of reasons, all of which can be addressed and solved.
 - d. You got frustrated with a teacher who you felt was not adequate.

2. **Stereotypes/Assumptions** about math –
 - a. Society’s False Messages. How many times have you heard someone say “I could never do math. Math is too hard”? The more we hear something said by other people, then the more we start to believe it. If you hear someone talking about how hard a certain course or activity is, then would you be excited to dive into it?
 - b. Do you picture people who are good at math as being “nerds”? Do you worry about what people will think of you if you do well in math?

Take steps to reduce/remove the anxiety

You may have identified with one or more of the causes of math anxiety discussed above. We will address each one, and you may find that you can incorporate any number of the following ideas into a plan to tackle your fear of math and get on with succeeding.

1a. Someone (teacher/classmate/family/friend) made you feel embarrassed about a question you asked, or an answer that you gave, or about a grade you received. This is where a pep talk is needed to convince you that just because you felt embarrassed about something in the past does not mean you need to continue feeling embarrassed. And maybe there really wasn't a reason to feel embarrassed in the past, after all. There is nothing wrong with asking questions, and your instructor will usually appreciate it if you do. Even if there is not adequate class time for your instructor to answer your question, they can let you know when you can get the answers you need. Ask questions fearlessly! The students around you will usually appreciate that you asked what they wanted to know themselves but were too afraid to ask. Don't be afraid of giving a "wrong" answer, because it means that you have a chance to get your mistake fixed before the question shows up on a quiz or test. You won't be the first one to give a wrong answer, and you surely won't be the last! Plus the more you begin to speak up with answers, the more likely others will be to follow. You can't change past grades, but you can change a pattern and get better grades in the future. You just have to be determined to make some changes in how you learn.

1b. You got frustrated with yourself over your performance on a test (or tests) even when you felt like you knew the material. Learning some specific skills on studying for and taking math tests can help.

How to Study for Math Tests

- A. **Review the chapter** (or section if this is for a quiz) in your textbook so that you get an overview of the material.
- B. **Review your notes** to determine what topics/problems have been emphasized.
- C. **Review any quizzes** that have been given for that chapter.
- D. Using your notes and text, **make a concept list** which is a list of major concepts and formulas which will be covered.
- E. **Review and rework homework problems**, noting how the problems work and applying that to other related problems.
- F. **Note similarities and differences among problems.** Do this for problems within the same chapter and for problems in different chapters.
- G. Locate additional problems and use them to **take a practice test.** Test yourself under conditions that are as realistic as possible (e.g., no notes, time restriction, random sequence of problems, etc.). Also try to predict test questions; make up your own problems and practice working them.
- H. Make you **write down any questions you have** or problems that gave you difficulty – ask your instructor in class or during office hours to go over those problems with you.

Special Techniques for Math Tests

- A. **Arrive on time.** It probably goes without saying that arriving too late means that you will be stressed and anxious right when you sit down to take the test. On the other hand, arriving too early will mean that you have excess time to start worrying. You will also expose yourself to “brain pickers”, which are other students who didn’t study and now are trying to get help from people right before the test begins. They can create needless anxiety in you.
- B. **Practice relaxation.** A number of relaxation techniques can be useful during a test. Take a few deep breaths; hold them for three to five seconds and let them out slowly. These deep breaths will help you relax and keep a sufficient supply of oxygen in your blood. Close your eyes and picture something that brings you joy. Relax your muscles by tensing and then relaxing them, one at a time. Do this with your hands, shoulders, stomach, feet, etc. Gently roll your shoulders to release tension that gathers there.
- C. **Stop those negative thoughts.** This is not just a lighthearted admonition. Negative thoughts do nothing but create more anxiety, which can cause a physical reaction in your body that makes it hard to relax and think clearly.
- D. **Do a memory dump when the test begins.** If you have memorized formulas or have other key information that you don’t want to forget, write them down in a suitable place on the test right when you receive it. Then you will have access to them throughout the test without worrying that you will blank out and forget them.
- E. **Budget time wisely during the test:** Quickly review the test before you begin and decide how much time you will spend on each part of the test. Pay attention to the weight of each section on your grade and make sure you allow enough time for sections that may take more time or are weighted more heavily in the final grade. It’s never fun to arrive at the last page of the test only to find an essay or long question worth 25 percent of your grade with only a few minutes remaining to complete the test. Start with the questions that you feel most confident about. Don’t spend too much time on harder questions if you are struggling with them. Skip them and go back later. When you have answered all of the questions, go back and carefully check your work, using all of the time allowed.
- F. **Read directions carefully.** It may be obvious what you are to do on some test questions, but for others there may be valuable information in the directions. Read the directions carefully to ensure that you understand what you are being asked to do as you respond to the questions.
- G. **Answer all the questions.** Some instructors give partial credit so it is important to try to answer all the questions, even if you are running out of time and can’t fully complete them.
- H. **Estimate first.** Estimation is a good way to double-check your work. Read the problem and guess approximately what the answer should be. Doing this first can help you notice if your computations go awry, and then you can correct the error quickly.
- I. **Perform opposite operations.** If a problem involves division, check your work by multiplying. Use addition to check subtraction.
- J. **Analyze before you compute.** Set up the problem before you begin to solve it. When a problem is worth a lot of points, read it twice, slowly. Analyze it carefully. When you take time to analyze a problem, you can often see ways to take computational shortcuts.

- K. **Translate problems into English.** Putting problems into words aids your understanding. When you study equations and formulas, put those into words too. The words help you see a variety of applications for each formula.
- L. **Make a picture.** Draw an elaborate colored picture or a diagram if you are stuck. Sometimes a visual representation will clear a blocked mind.
- M. **Check your work systematically.** When you check your work, ask yourself: Did I read the problem correctly? Did I use the correct formula or equation? Is my arithmetic correct? Is my answer in the proper form? If you find an answer that you think is wrong, work it for a third time before changing your answer.

1c. You got frustrated with what you thought was your inability to understand the material. This can be for a huge number of reasons, all of which can be addressed and solved. There is no such thing as not being smart enough to do math. But there is such a thing as learning to be smart with how you learn and how you approach college life.

A. Develop good lifestyle habits – Make physical activity a part of your daily routine, eat right, and get good rest. Physical exercise helps to use up stress hormones and can help you sleep better. Try to set a regular time to get up and go to bed each day, so that your body doesn't go through huge fluctuations that can affect your ability to be alert. Lack of sleep can interfere with memory and cause irritability, anxiety, and confusion. Eat foods that are healthful and will contribute to your physical well being. Physical exercise, good rest, and a good diet will mean you are less likely to get sick. It can be tough to attend class, study, and do well if you are sick.

B. Class/study skills

- a. class time – **Participate actively in class.** Success in math depends on your coming to class regularly, coming to class with homework finished, and speaking up when you have a question. Math is a subject that builds on previously learned ideas. By not missing class and homework assignments, you will always be prepared to handle the next concept. If you have to miss a class, make sure that you go over the material you missed and get the assignment done so that you are up to speed for the next class. **Learning to ask questions is extremely important.**
- b. study time – **Do math every day.** If you save a week's worth of assignments and try to do them all in one day, you will be less likely to succeed. Research shows that the sooner you work on a concept after first seeing it in class, the more you will remember. Try to work on it consistently throughout the week so that what you are learning each day will be better retained. Learning a little bit each day will give better results than cramming a week's worth of

learning into one day. **Approach math like you would a foreign language.** Make note cards or a list of the vocabulary being used in your text and by your instructor. You will be able to better understand what is being discussed and presented in class, and you will be able to understand the direction better when it comes to quizzes and tests. **Figure out what kind of learner you are.** If you learn better through auditory means, then make sure you get together with other students to discuss your assignments. Find a place where you can “study out loud” so that you can talk to yourself as you work. Ask your instructor if you can record the lectures so that you can replay them for yourself later. If you learn better through visual means, concentrate on using your textbook thoroughly. Write in it, highlighting important concepts. Write out note cards with key ideas. If you are a tactile learner, meaning that you need to put your whole body into the process, you will need to get a little creative with studying and working on math. Find a place where you can move around as you think through a problem. Instead of sitting in chair, get a large exercise ball to sit on. In class, make sure that you are writing things down rather than just looking at what the instructor puts on the board.

- c. notebook – Getting organized for your class will take you a long way towards succeeding. Use a three ring binder that you can divide into sections. One section can be for all of the **handouts** that you receive during the class. A section for **taking notes** during class time makes a good reference source. One of the most important sections will be for **homework**. By using a three ring binder you can keep your homework in order after it is returned to you. This will become important when you are studying for quizzes and tests. A critical section will be one for **quizzes and tests**. Keep them in the order in which you took them. Correct any problems that you miss, either directly on the quiz or test, or on a separate piece of paper. These will be the first thing that you should look at when it comes time to study for the final exam. You may want a section for **defining words and formulas**. These can come from the text and from lectures. Try your best to write definitions in your own words, as well as using the formal language of the text. Keep a hole-punch (even a small one) with your notebook.
- d. textbook – **Read slowly.** It is ineffective to breeze through a math book as you would the newspaper. A single paragraph may merit 15 to 20 minutes of sustained attention. **Read Actively.** Work out examples and copy diagrams, formulas or equations. **Use all sections of the book.** Most math books have

selected answers in the back. Make sure that you are checking your work. It does absolutely no good to spend hours on an assignment if you don't know whether you are doing the problems correctly or not.

C. Time management. Learning time management skills can make a huge difference in whether you succeed in all of your classes. It is generally expected that you will spend 2 to 4 hours outside of class for every one hour that you spend in class. If you find it hard to devote that amount, then you need to look at what other things are taking up your time. Start to prioritize all of the things that are demanding your time, listing them in order of importance from greatest to least. Sure, you would like to be doing those things at the bottom of the list right now, but maybe they need to wait until you have more time in your life. College definitely requires some sacrifices, and giving up some “fun” now is better than failing your classes and going on to a lifetime of unfulfilling jobs because you didn't make it through college. You need to be honest with yourself about why you are in college, and decide whether you want to dedicate the time that it requires. Here are a few specific tips to help you manage your time better:

- a. Use a day planner and balance your activities.** After filling in set commitments like class and work time, fill in study times that you will treat just as if they were a class. You can estimate those amounts based on what was said in the previous paragraph. Plan your other activities like exercise and social time around your class and study time. Try to schedule a good balance of your activities so that you won't be setting yourself up for failure. If you know that you study better in smaller chunks of time, schedule some exercise (or other non-study oriented activity) time in the middle of long study times. Try hard to stick to your planned schedule.
- b. Use “To Do” lists.** You may want to make one each morning, you may want to have a weekly one, or you may even want to keep a small list for each class.
- c. Work efficiently (know when to stop).** If you recognize at any time that you are starting to lose your ability to concentrate and do a good job during study or homework time, take a small break. You will come back (just promise that you will remember to come back!) refreshed and you will most likely be able to focus and work more efficiently.

1d. You got frustrated with a teacher who you felt was not adequate. Be careful to be very honest with yourself on this one. It is easy to blame someone else rather than take responsibility for our failures. At this point in your life you need to let the past be the past, and get on with succeeding. You

can't change anything now about who your teacher was 5 or 10 years ago. This may sound cruel and uncaring, but sometimes we need to just let go of anger so that it does not continue to drag us down and prevent us from succeeding in the present.

2a. Society's False Messages. How many times have you heard someone say "I could never do math," "Math is too hard", or "I don't have the right kind of brain for math"? The more we hear something said by other people, then the more we start to believe it. If you hear someone talking about how hard a certain course or activity is, then would you be excited to dive into it?

There is no evidence that certain brains cannot do math, and you do not need to fall into the trap of believing statements that aren't true. People often make faulty assumptions about how math is learned such as "math calls only for logic, not imagination", or "there's only one right way to solve a math problem". Math can use lots of creativity because there is often more than one way to solve a problem. People used to say that the world was flat and that women should not be allowed to vote. Do you really want to believe everything that you hear?

2b. Do you picture people who are good at math as being nerds? Do you worry about what people will think of you if you do well in math? Think again! Succeeding in math (and science) won't make you a nerd. It can make you feel like a person who has accomplished great things and thus can accomplish anything in the future.