

MATH 160 – SPRING 2017

PRECALCULUS

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Office: Building 61 – Room 1658
Office hours: M 11:00 – 11:30, 4:00 – 4:30; W 10:45 – 11:30, 4:00 – 4:30; F 10:45 – 11:30, 1:05 – 1:55
Text: *Precalculus* (10th edition) by Sullivan
Section MW # 41426 4:30 – 6:35 pm and MW #41550 6:45 – 8:50 pm, Bldg 61 – Room 2410

Course Description and Objectives

This course studies the basic functions used in Calculus: the polynomial, rational, exponential, logarithmic, trigonometric, and inverse trigonometric function. Topics include recognizing, graphing and solving equations involving these functions, working with function notation, transformations of functions and applications. Other topics include the binomial theorem, conic sections, vectors, and the dot product. Some of the course objectives are:

- Graph functions using translations and reflections
- Determine the domain of a function
- Operate with functions
- Find the inverse of a function
- Use linear and quadratic functions to solve application problems
- Solve for the complex roots of polynomial functions
- Analyze polynomial, rational, exponential, logarithmic, and trigonometric equations
- Solve polynomial, rational, exponential, logarithmic, and trigonometric equations.
- Operate with vectors, including the dot product; use vectors to solve application problems
- Find the partial fraction decomposition of a rational expression
- Graph conic sections; recognize or derive their properties, and write their equations
- Solve and graph systems of nonlinear equations
- Analyze arithmetic and geometric sequences
- Use the binomial theorem.
- Apply studied principles and skills to new situations in addition to situations that mirror those on the homework and those shown in class.

My Expectations

To succeed in this course you must attend class regularly, study often, utilize the resources available, and ask questions if you are confused.

Prerequisites

There is an official prerequisite for this course (Math 150 – Trigonometry), and I expect that you demonstrate college algebra and trigonometry skills (linear, quadratic, polynomial, rational, trigonometric functions). It is your responsibility to know the prerequisite material when you register for this class. If you do not know the material covered in the previous classes, it would be better for you to take the previous class (Math 150) or review that material first, then register for Math 160.

Late Work

Be prepared with all assignments on the day they are due. As a rule, there are no make up tests. I have been having an issue with students coming to class late and students turning in late work. I have found a need to develop a policy that is consistent and fair to all my students including those that get to class on time and those who turn their work on time. See the table below for my policy on assignments that are turned in after the beginning of the class the assignment is due.

On Time: Turned in at the beginning of class	100% - missed/incorrect questions
Turned in next class meeting Only completed homework will be accepted. Do not turn in late homework if it is incomplete	50% - missed/incorrect questions
Turned in beyond the next class meeting	0% - no credit given

Attendance and Participation

Understanding math requires more than just reading a textbook. Listening and participating in the class activities are as important as solving problems. College policy requires that you attend every class meeting. Moreover, I do notice when you do not show up. If your grade is on a borderline, those with regular attendance are more likely to be on the higher side of the line. In addition, you miss the material from that day and that day's quiz.

NOTE: You the student are responsible for dropping the course should you decide not to continue in it. If you stop attending and doing the work and you fail to drop, you will receive a failing grade in this course. If you miss class, are late more than 15 minutes, or leave early during the add period, you will be dropped and someone on the waiting list will be added. If you are absent three times or more, you may be dropped from class. Being late or leaving early counts as half a day.

Calculators

Most of the homework problems I will assign this semester will be done using paper, pencil, ruler and a scientific calculator. However, a graphing calculator *may* be necessary for some of the homework problems. You could borrow a graphing calculators from T-MARC. No graphing calculator will be allowed during the tests.

Study Time

You are expected to study about two hours outside class for every hour in class – that is an average of about 8 hours a week. Some students will need more time to study while others might be successful with fewer hours.

Do not panic; just be ready to put your work in. Work includes, but is not limited to:

- being an active participant in class: pay close attention, ask questions, and take copious notes
- doing all of the assigned homework
- reading the chapters
- as you read a chapter, you try each example problem. You should be able to solve the problem on your own before going on to the next problem. You should do this for each chapter.
- Going through your lecture notes, recopying them if necessary, until you understand everything that was presented in the lecture and can do the problems that were done in class on your own
- getting together with other students to discuss and work on the problems
- when you are done with the homework, you should be able to answer any of the questions or do any of the problems assigned on your own, from the beginning
- your written work should be clear enough that any of your peers can understand it

Respect in the Classroom

Leaving during class

It is disruptive to me and other students when an individual wanders in and out of the classroom. This is a classroom not a movie theater. If you have to leave class while it is in session, **leave permanently for that class period**. I will not allow you to reenter the room. Go to the restroom before you come to class. Make important phone calls ahead of time.

Coming to class late

To succeed in this course you must get to class on time. Walking in late is disruptive to me and other students. I know there are times when things happen that are beyond your control. However, if you are habitually late I will ask you to drop this class and take a class at a time that works better with your schedule. Make sure that you also read the *Attendance and Participation Policy* above.

Cell Phones

The use of cell phones during class is disruptive to me and the students that sit near you. Cell phone use in class shows a lack of respect to your peers. You may use your cell phone during breaks. I expect your cell phones to be in your pocket, purse, or backpack at all other times. You are not allowed to have your cell phone or smart watch during a test/quiz. You must put it in your backpack, purse, or on my front desk. If I see you with a cell phone or smart watch on you during a test/quiz, you will receive an F (0 points) on that test.

Help and Resources

If you are feeling lost or overwhelmed: talk to me, use my website, visit the T-MARC (Transfer Math Activities Resource Center) . T-MARC is located in building 61 on the first floor, room 1314, near the elevator. T-MARC phone extension is 5389. T-MARC offers services including free tutoring, study spaces, tutorial software, video lectures on CR-Rom or DVD, calculator, textbooks, solution manuals, and handouts

The tutors and instructor in charge with the lab (Rene Pyle) will be able to answer your questions. They can help you understand the problems, but they cannot do the homework for you. You, the student, are expected to do the homework. T-MARC would also be a great place to meet if you decide to start or join a study group.

Free tutorial services are also available at the Learning Assistance Center, Building 6, room 101.

Accommodations

If you feel that you have a disability that may prevent you from succeeding in this class, please contact the DSPS office located in the Student Services Building 9B.

Academic Integrity

According to the Mt. SAC policy on academic integrity an instructor who determines that a students has cheated may give the students a failing grade for the assignment. The actions shall be reported to the Dean, Students Services, and Director, Student Life. Plagiarism or cheating will not be tolerated in my class. There will be a zero on the assignment and risk failing the course.

Some examples of cheating include, but are not limited to: having or using unauthorized materials or calculators during any exam or quiz, notes concealed in or written on clothing, hats, desk, or skin (as examples), looking at another student's work during any exam or quiz, removing an exam or quiz from the classroom, taking photos of exams and quizzes, allowing another student to look at your exam or quiz, or allowing another student to copy your homework or other assignments, turning in work that was generated by other individuals, having a cell phone at your seat during an exam (if you have a cell phone in your possession I consider that cheating).

Organization, Grading and Requirements

I recommend you have a 3-hole binder with 3 separators, labeled as follows:

LECTURES

HOMEWORK

TESTS & QUIZZES

- **LECTURES** – Pay attention in class to what I say and do, and make careful notes. In particular, note the problems I work on the board, and copy the complete solutions as well as the theory presented in each section. Work as neatly as you can. Write your symbols clearly, and make sure the exercises are clearly separated from each other. Do not hesitate to ask questions in class. It is not a sign of weakness, but of strength. There are always other students with the same question who are too shy to ask. Do not expect to always understand everything in class. If necessary, rewrite your notes when you get home.
- **HOMEWORK** – Before you start on homework assignments, rework the problems I worked in class as well as all examples from the textbook . You should be able to solve the problems on your own. Make sure you check your previous work against the solution sections posted on my website. Print out the solutions from my website for your reference.
- Keep all homework, quizzes and tests that are returned to you in your binder. Use them when you study for future tests and for the final exam.

Assignments in the course are divided into four areas and are worth a total of 1000 points. Those earning 900 points or more will be awarded an A, 800 to 899 points a B, 700 to 799 points a C, 600 to 699 points a D and less than 599 points an F.

Homework 10% points

The **written homework** is due at the beginning of the class. In general, this homework is **due the day of a test/quiz**.

Read carefully all the directions from the homework handout. **Sloppy homework will not be graded.**

Homework that does not follow ALL the directions will not be graded. You must staple each section separately, as only one or two random sections will be collected. You are encouraged to discuss assignments with your classmates; however, you are required to write up your work independently. Copied homework will not be tolerated and identical, or nearly identical, assignments will share a single homework score. I will make every effort to address homework questions in class *as time permits*. . If you would like to ask a question from homework, please write down the number and the corresponding section of the problem you want to ask on papers so that we will not lose class time while you are flipping over the pages. **DO NOT ASK QUESTIONS ON HOMEWORK PROBLEMS THAT YOU HAVE NOT EVEN ATTEMPTED!** Please feel free to come to my office hours or contact me by email if you need additional help.

Quizzes 20% points

Two quizzes will be given (see Tentative Class Schedule). They may be given at the beginning or at the end of the class. These quizzes will be similar to the exercises and examples done in class as well as homework problems assigned from the topics covered up to that point. For an exercise to be complete there needs to be a detailed solution to the problem. Do not just write down an answer. **No proof, no credit given!**

Tests 40% points

Two tests will be given over the major areas addressed in the course. For an exercise to be complete there needs to be a detailed solution to the problem. Do not just write down an answer. **No proof, no credit given!**

Comprehensive final 30% points

The final is a 2 ½ hour exam and it is held on Monday, June 6. The final is a cumulative exam. If you qualify (homework score must be at least 70%) , you may use the final exam percent score to replace your lowest test score. However, a test with a score of zero cannot be replaced by the final score. You must take the final exam to pass this class.

Extra Credit: Do not ask for extra credit. It may be offered, but not when requested! Your final grade in the course will (and should) reflect your level of mathematical knowledge, comprehension, and problem solving skills. It will not (and should not) reflect directly how much effort you put in, how much “stuff” you did, or how important it is for you to pass.

Grade Sheet

Homework	+	
Homework	+	
Homework	+	
Homework	+	
Homework	+	
HOMEWORK	=	/ 100
Quiz 1		/
Quiz 2	+	/
QUIZZES	=	/200
Test 1		/
Test 2	+	/
TESTS	=	/400
FINAL EXAM	=	/300
TOTAL	=	/1000

Tentative Class Schedule

DATE		TOPICS	ASSIGNMENTS DUE
Monday	February 27	2.1, 2.2	
Wednesday	March 1	2.3, 2.4	
Monday	March 6	2.5, 2.6	
Wednesday	March 8	More functions	
Monday	March 13	Quiz 1 3.1, 3.2	Homework #1
Wednesday	March 15	3.3, 3.4, 3.5	
Monday	March 20	4.1, 4.2,	
Wednesday	March 22	4.3, 4.4	
Monday	March 27	4.5, 4.6	
Wednesday	March 29	Review	
Monday	April 3	Test 1	Homework #2
Wednesday	April 5	5.1, 5.2	
Monday	April 10	5.3, 5.4	
Wednesday	April 12	5.5, 5.6	
Monday	April 17	5.7, 5.8	
Wednesday	April 19	6.1, 6.2, 6.3	
Monday	April 24	Quiz 2 6.4	Homework #3
Wednesday	April 26	6.5, 6.6, 7.1	
Monday	May 1	7.2, 7.3	
Wednesday	May 3	7.4, 7.5, 7.6, 7.7	
Monday	May 8	8.1	
Wednesday	May 10	Review	
Monday	May 15	Test 2	Homework #4
Wednesday	May 17	9.4, 9.5	
Monday	May 22	10.1 – 10.4	
Wednesday	May 24	11.5	
Monday	May 29	Holiday – Memorial Day	
Wednesday	May 31	11.6, 4.4	
Monday	June 5	12.1 – 12.3	
Wednesday	June 7	12.4 – 12.5	
		Final Exam Monday, June 12 4:30 – 7:00 pm (#41426) 7:30 – 10:00 pm (#41550)	Homework #5

10 Rules of Good Studying

by Barbara Oakley, PhD, PE

- 1. Use recall.** After you read a page, look away and recall the main ideas. Highlight very little, and never highlight anything you haven't put in your mind first by recalling. Try recalling main ideas when you are walking to class or in a different room from where you originally learned it. An ability to recall – to generate the ideas from inside yourself – is one of the key indicators of good learning.
- 2. Test yourself.** On everything. All the time. Flash cards are your friend.
- 3. Chunk your problems.** Chunking is understanding and practicing with a problem solution so that it can all come to mind in a flash. After you solve a problem, rehearse it. Make sure you can solve it cold – every step. Pretend it's a song and learn to play it over and over again, so the information combines into one smooth chunk you can pull up whenever you want.
- 4. Space your repetition.** Spread out your learning in any subject a little every day, just like an athlete. Your brain is like a muscle – it can handle only a limited amount of exercise on one subject at a time.
- 5. Alternate different problem-solving techniques during your practice.** Never practice too long at any one session using only one problem-solving technique – after a while, you are just mimicking what you did on the previous problem. Mix it up and work on different types of problems. This teaches you both *how* and *when* to use a technique. (Books generally are not set up this way, so you'll need to do this on your own.) After every assignment and test, go over your errors, make sure you understand why you made them, and then rework your solutions. To study most effectively, handwrite (don't type) a problem on one side of a flash card and the solution on the other. Handwriting builds stronger neural structures in memory than typing. You might also photograph the card if you want to load it into a study app on your smart phone. Quiz yourself randomly on different types of problems. Another way to do this is to randomly flip through your book, pick out a problem, and see whether you can solve it cold.
- 6. Take breaks.** It is common to be unable to solve problems or figure out concepts in math and science the first time you encounter them. This is why a little study every day is much better than a lot of studying all at once. When you get frustrated with a math or science problem, take a break so that another part of your mind can takeover and work in the background.
- 7. Use explanatory questioning and simple analogies.** Whenever you are struggling with a concept, think to yourself, How can I explain this so that a ten-year-old could understand it? Using an analogy really helps, like saying that the flow of electricity is like the flow of water. Don't just think your explanation – say it out loud or put it in writing. The additional effort of speaking and writing allows you to more deeply encode (That is, convert into neural memory structures) what you are learning.
- 8. Focus.** Turn off all interrupting beeps and alarms on your phone and computer, and then turn on a timer for twenty-five minutes. Focus intently for those twenty-five minutes and try to work as diligently as you can. After the timer goes off, give yourself a small, fun reward. A few of these sessions in a day can really move your studies forward. Try to set up times and places where studying - not glancing at your computer or phone – is just something you naturally do.
- 9. Eat your frogs first.** Do the hardest thing earliest in the day, when you are fresh.
- 10. Make a mental contrast.** Imagine where you've come from and contrast that with the dream of where your studies will take you. Post a picture or words in your workspace to remind you of your dream. Look at that when you find motivation lagging. This work will pay off both for you and those you love!

10 Rules of Bad Studying

by Barbara Oakley, PhD, PE

Avoid these techniques – they can waste your time even while they fool you into thinking you’re learning!

- 1. Passive rereading** – sitting passively and running your eyes back over a page. Unless you can prove that the material is moving into your brain by recalling the main ideas without looking at the page, rereading is a waste of time.
 - 2. Letting highlights overwhelm you.** Highlighting your text can fool your mind into thinking you are putting something in your brain, when all you’re really doing is moving your hand. A little highlighting here and there is okay – sometimes it can be helpful in flagging important points. But if you are using highlighting as a memory tool, make sure that what you mark is also going into your brain.
 - 3. Merely glancing at a problem’s solution and thinking you know how to do it.** This is one of the worst errors students make while studying. You need to be able to solve a problem step-by-step, without looking at the solution.
 - 4. Waiting until the last minute to study.** Would you cram at the last minute of you were practicing for a track meet? Your brain is like a muscle – it can handle only a limited amount of exercise on one subject at a time.
 - 5. Repeatedly solving problems of the same type that you already know how to solve.** If you just sit around solving similar problems during your practice, you’re not actually preparing for a test – it’s like preparing for a big basketball game by just practicing dribbling.
 - 6. Letting study sessions with friends turn into chat sessions.** Checking your problem solving with friends, and quizzing one another on what you know, can make learning more enjoyable, expose flaws in your thinking, and deepen your learning. But if your joint study sessions turn to fun before the work is done, you’re wasting your time and should find another study group.
 - 7. Neglecting to read the textbook before you start working problems.** Would you dive into a pool before you knew how to swim? The textbook is your swimming instructor – it guides you toward the answers. You will flounder and waste your time if you don’t bother to read it. Before you begin to read, however, take a quick glance over the chapter or section to get a sense of what it’s about.
 - 8. Not checking with your instructors or classmates to clear up points of confusion.** Professors are used to lost students coming in for guidance – it’s our job to help you. The students we worry about are the ones who don’t come in. Don’t be one of those students.
 - 9. Thinking you can learn deeply when you are being constantly distracted** Every tiny pull toward an instant message or conversation means you have less brain power to devote to learning. Every tug if interrupted attention pulls out tiny neural roots before they can grow.
 - 10. Not getting enough sleep** Your brain pieces together problem-solving techniques when you sleep, and it also practices and repeats whatever you put in mind before you go to sleep. Prolonged fatigue allows toxins to build up in the brain that disrupt the neural connections you need to think quickly and well. If you don’t get a good sleep before a test, nothing else you have done will matter.
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Mark your calendar, as there will be no reminders in class about this particular homework.

WRITE NEATLY and SPACE OUT YOUR WORK. On a clean sheet of paper write your name and class (Class number and hours- for example, Math 160, 4:30 – 6:35).

Syllabus Homework #1 – due Monday, March 6 at the beginning of class.

- 1) From the list above, list what (if any) rules of good studying you have used up to this point.
- 2) From the list above, list what (if any) rules of bad studying you are guilty of ☺ .
- 3) Write a small paragraph describing where you want your studies to take you.

Syllabus Homework #2 – due Wednesday, June 7, at the beginning of class.

- 1) From the list above, list what rules of good studying you have started implementing and when you first started. What rules of bad studying did you stop doing?
- 2) In a small paragraph, explain how these changes have affected you.