

MTH 103 T/Th Course Syllabus

Section: 063

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Office Hours: Tuesday 5:00-6:00pm

Textbook: No official textbook is required for this course. Course content, along with explanations and practice for all of the objectives, is included in D2L.

Calculator: A graphing calculator is required for this course. You are expected to bring your calculator to every class meeting. The recommended calculators are TI83+, TI 84, or TI 84+. You are responsible for developing proficiency with your calculator. **NOTE:** Some calculating devices are inappropriate for this course. Devices which can perform algebraic symbol manipulation ('computer algebra') should not be used for any graded work in this course. Prohibited devices include: cell phones, tablets, laptops, TI89, TI-Nspire CAS, TI92, TI92+, HP49G, HP49G+, HP50G, and Casios algefx2.0 and algefx2.0pls.

WeBWorK: Graded homework is completed online using WeBWorK. The course fee for WeBWorK is \$70. Login instructions, payment information, due dates, etc, can be found on the WeBWorK website (<http://math.msu.edu/WeBWorK>). The **WeBWorK fee is due before September 25th**. WeBWorK **can be used for free** up to the due date. If you pay the WeBWorK fee and later drop the class, the fee will not be refunded. Thus if you are not sure whether you want to stay in the class, we recommend you use WeBWorK without paying the fee until a few days before the due date. Webwork will open on August 29th. More information about WeBWorK assignments can be found on Pages 2 & 3 of this syllabus.

D2L Site: The course site is hosted on D2L (<https://d2l.msu.edu>). This is where course materials, important deadlines, and course announcements will be posted. Additionally, practice materials with solutions will be available on this D2L site for each course objective.

Grading: Grades in this course are based upon the scores from WeBWorK, quizzes, three in-class exams, and a final exam. Assessment will be distributed according to the following percentages.

Assessment	WeBWorK	Quizzes	Exam 1	Exam 2	Exam 3	Final Exam
Total Percentage	12.5%	12.5%	15%	15%	15%	30%

The following grading scale can be used to estimate grades for individual WeBWorK, quizzes, and exams.

GRADE	0.0	1.0	1.5	2.0	2.5	3.0	3.5	4.0
% GRADE	[0, 55)	[55, 60)	[60, 65)	[65, 73)	[73, 79)	[79, 85)	[85, 90)	[90, 100]

- Homework:** WeBWorK homework will be done online at <http://math.msu.edu/webwork>. Homework deadlines are available on the WeBWorK site and also on Page 3 of this syllabus. Assignments submitted up to 48 hours after the 100% credit deadline will receive 75% of the score received. Make-ups will not be permitted and no assignments will be dropped.
- Quizzes:** There will be nine quizzes, given in class. Each student's lowest two quiz grades will be dropped. For this reason, no excuses are accepted or required for missed quizzes. The two dropped scores will accommodate quizzes missed due to illness or other personal reasons, as well as low quiz scores. **There will be no make-up quizzes**, with the exception of some MSU-related activities. See the instructor ahead of time to see if you qualify for a make-up.
- Exams:** In-class exams are scheduled for **Thursday September 27th, Thursday October 25th, and Thursday November 29th** during class. There will be **no make-up exams!** A missed exam will receive a score of 0 unless the absence was approved by the instructor prior to the exam (or after the exam in the case of an emergency). Only extreme situations with official documentation will allow for such an approved absence from an exam. If excused, the score for the missed exam will then be determined from the corresponding exam questions on the final exam.
- The cumulative final exam is scheduled for **Monday, December 10, 10am – 12pm**. The room locations will be announced toward the end of November. Students are expected to take the final exam at the scheduled time -- the university has strict rules for exceptions. In particular, travel plans do not constitute a sufficient excuse for rescheduling the final. If a student has two other final exams on the same day they are eligible to take a make-up final exam on Tuesday, December 11th. (If you qualify for the make-up final exam, you must fill out a request (https://math.msu.edu/Classes/final_exam_rooms.aspx#make-up)). You will not be allowed to take the make-up final without registering.)
- Regrading:** If you have any questions regarding the grading of an exam or quiz, your paper must be handed back to the instructor for re-grading at the end of the class period during which you received it. ***Once a graded paper has left the classroom, no grading changes will be made.***
- MLC:** The Mathematics Learning Center (MLC) offers free help for Math 103 students. Its main location is C126A Wells Hall; there are additional satellite locations around campus. For more details and hours, visit <https://www.math.msu.edu/mlc/>.
- Honesty:** The math department adheres to the university policies on academic honesty. Students caught cheating may receive a 0.0 on the assignment/exam or fail the course. Cheating includes using unapproved devices or materials, and copying another person's work. For more information visit <https://msu.edu/~ombud/> and <https://honorcode.msu.edu/>
- SPARTAN CODE OF HONOR:** *“As a Spartan, I will strive to uphold values of the highest ethical standard. I will practice honesty in my work, foster honesty in my peers, and take pride in knowing that honor is worth more than grades. I will carry these values beyond my time as a student at Michigan State University, continuing the endeavor to build personal integrity in all that I do.”* (Written by students for students.)

Important Dates:

Wednesday, August 29	First day of classes
Monday, September 3	Labor Day – University is closed
Wednesday, September 5	Online open add period ends at 8 pm
Thursday, September 6 – Wednesday, September 12	Students go to C212 for math enrollment changes (late adds, section changes, course changes) by Wednesday, September 12 @ 4:30 pm
Monday, September 24	End of 100% tuition refund period
Tuesday, September 25	WeBWorK payment due by 10:00 am
Wednesday, October 17	MIDDLE OF SEMESTER – Last day to drop a course or withdraw from all courses with no grade reported.
Thursday-Friday, Nov. 22-23	Thanksgiving Break – University is closed
Friday, December 7	Last day of classes
Monday, December 10	MTH 103 Final Exam, 10-noon, Location TBA

WeBWorK Due Dates for T/Th Classes: (Homework must be submitted by 7:00 am for all due dates.)

Assignments	100% Credit	75% Credit
Tutorial	9/12	9/14
A1, A2, A3, A4	9/12	9/14
A5, A6	9/16	9/18
A7	9/19	9/21
B1, B2	9/23	9/25
B3, B4	9/26	9/28
B5, B6, B7	9/30	10/2
C1	10/7	10/9
C2	10/10	10/12
C3	10/14	10/16
C4	10/17	10/19
C5	10/21	10/23
C6, C7	10/28	10/30
D1	11/4	11/6
D2	11/7	11/9
D3, D4	11/11	11/13
D5, D6	11/14	11/16
E1	11/18	11/20
E2, E3	11/21	11/23
E4, E5	11/28	11/30
E6, E7	12/2	12/4
E8	12/9	Not Available

Schedule of Lectures:

DATE:	TOPIC:	LESSON:	OBJECTIVES:
Aug 30	Function Overview	Lesson 1	A1, A2, A3
Sep 4	Function Overview Graphing Functions	Lessons 1, 2	A1, A2, A3, A4
Sep 6	Graphing Functions Quiz 1	Lesson 2	A4
Sep 11	Operations, Composition, and Inverses	Lesson 3	A5, A6, A7
Sep 13	Operations, Composition, and Inverses Quiz 2	Lesson 3	A5, A6, A7
Sep 18	Representations of Linear Functions Linear Applications and Linear Systems	Lessons 4, 5	B1, B2, B3, B4
Sep 20	Linear Applications and Linear Systems Quiz 3	Lesson 5	B3, B4
Sep 25	Absolute Value Functions and Average Rate of Change	Lessons 6, 7	B5, B6, B7
Sep 27	EXAM 1		
Oct 2	Properties of Exponents and Logarithms	Lesson 8	C1, C2
Oct 4	Properties of Exponents and Logarithms Quiz 4	Lesson 8	C1, C2
Oct 9	Representations of Exponential Functions	Lesson 9	C3, C4
Oct 11	Representations of Exponential Functions Quiz 5	Lesson 9	C3, C4
Oct 16	Representations of Logarithmic Functions Applications of Exponential Functions	Lesson 10, 11	C5, C6
Oct 18	Applications of Exponential Functions Quiz 6	Lesson 11	C6
Oct 23	Applications of Exponential, Logarithmic, and Logistic Functions	Lesson 11	C6, C7
Oct 25	EXAM 2		
Oct 30	Operations on Polynomial Expressions	Lesson 12	D1
Nov 1	Quadratic Functions Quiz 7	Lesson 13	D2, D3, D4
Nov 6	Quadratic Functions Polynomial Functions	Lessons 13, 14	D2, D3, D4, D5
Nov 8	Polynomial Functions Square Root Functions Quiz 8	Lessons 14, 15	D5, D6
Nov 13	Operations on Rational Expressions	Lesson 16	E1
Nov 15	Rational Functions and Limits Quiz 9	Lesson 17	E2, E3
Nov 20	Rational Functions	Lesson 18	E4, E5, E6
Nov 22	NO CLASS		
Nov 27	Rational Functions Applications of Rational Functions	Lesson 18, 19	E4, E5, E6, E7
Nov 29	EXAM 3		
Dec 4	Direct and Inverse Variation	Lesson 20	E8
Dec 6	Review		

COURSE OBJECTIVES:

The objectives below refer to the **four representations of a function**. These four representations are **numerical** (a table of data), **graphical** (the graph of the function), **verbal** (using a word description), and **symbolic** (an equation for the function).

UNIT 1: Introduction to Functions

- A1: Student can determine if a relation is a function, given any of the four representations, and justify their conclusion.
- A2: Given a symbolic or verbal representation of a function, including piecewise functions, student can create a table and graph.
- A3: Student can interpret function notation and find and interpret function values in all four representations.
- A4: Student can identify features of a function given as a table or a graph, including the domain and range, the intercepts, the intervals where the function is increasing/decreasing, and the intervals where the function is positive/negative.
- A5: Student can add, subtract, multiply, and divide functions given in all four representations, and simplify when necessary/possible.
- A6: Student can evaluate and interpret a composition of two or more functions in all four representations.
- A7: Given a numerical, graphical, or symbolic representation of a function, student can determine if the function is invertible, and if so find and evaluate its inverse.

UNIT 2: Linear Functions

- B1: Given any of the four representations of a function, student can determine if it is linear and, if so, student can find the slope and intercepts.
- B2: Given one representation of a linear function, student can create or identify the other three.
- B3: Given data or a verbal description, student can find a linear model and use it to solve application problems.
- B4: Student can find a solution, if one exists, to a system of linear equations and use it to solve application problems.
- B5: Given a graphical or symbolic (including piecewise) representation of an absolute value function, student can find the other representations.
- B6: Student can use equation or graph to find solutions to absolute value equations and inequalities.
- B7: Given a function in any of the four representations, student can evaluate the average rate of change (AROC) between two points.

UNIT 3: Exponential and Logarithmic Functions

- C1: Student can use basic properties of exponents.
- C2: Student can interpret a logarithmic statement and use basic properties of logarithms to rewrite expressions and solve equations.
- C3: Given any of the four representations of a function, student can determine if the function could be exponential.
- C4: Given one representation of an exponential function, student can create or identify the other three.
- C5: Given a logarithmic function, student can identify intercepts, asymptotes, domain/range, and sketch the graph of the function.
- C6: Given data or a verbal description, student can find an exponential model and use it to solve application problems.
- C7: Students can use logarithmic or logistic models to solve application problems.

UNIT 4: Polynomial and Square Root Functions

- D1: Students can perform operations on polynomial expressions, including multiplication, division, and factoring.
- D2: Student can identify the domain, range, x-intercept, y-intercept, axis of symmetry, and vertex of a quadratic function given in any of the four representations.
- D3: Given a graph of, or information about, a quadratic function, student can find an equation for the function.
- D4: Student can use quadratic functions to solve application problems.
- D5: Given information about a polynomial function, student can sketch the graph and/or draw conclusions.
- D6: Student can find domain, range, x-intercepts, y-intercepts and point of origin of a square root function.

UNIT 5: Rational Functions

- E1: Student can perform operations on rational functions and solve rational equations.
- E2: Given information about a basic rational function, student can find a symbolic or graphical representation.
- E3: Given a graphical representation of a function, student can find one-sided and two-sided limits.
- E4: Student can identify domain, x-intercepts, y-intercepts, vertical asymptotes, and holes from a graphical or symbolic representation of a rational function.
- E5: Student can find horizontal and slant asymptotes from a graphical or symbolic representation of a rational function.
- E6: Given an equation of a rational function, student can determine where the function values are positive, negative, zero, and undefined.
- E7: Student can use rational functions to solve application problems.
- E8: Student can set up and solve direct and inverse variation application problems.

Useful Links:

Math Home Page: <https://math.msu.edu/>

D2L: <https://d2l.msu.edu>

Class Pages: <https://math.msu.edu/classpages/> (Syllabus, Grade Calculator)

Webwork: <http://www.math.msu.edu/Webwork> (Assigned Homework, Due Dates, Tech Help)

Math Learning Center: <http://www.math.msu.edu/mlc> (Locations, Hours, Exam Review Session Dates/Times)

Sample Final: https://www.math.msu.edu/classes/sample_finals.aspx

Final Exam Makeup Request: https://math.msu.edu/Classes/final_exam_rooms.aspx#make-up