

MATH 1051 FA, Functions and Trigonometry

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Office Hours: Wednesdays 1:00 – 2:00 PM Class Hours: M/W/F 11:30 A.M. – 12:30 P.M.

Office: RB 2006

Class Room: RC 1003

Lab Time: Mondays 2:30 – 4:30 PM

Lab Room: RC 1003

Course Description

From the course calendar:

For students without grade 12 U Advanced Functions or equivalent. Cartesian coördinate systems; linear equations and straight lines; quadratic equations and parabolas; functions, including domain, range, graph, and composition of functions; angles and radian measure; the trigonometric functions, their graphs, and identities; the sine and cosine rules; polar coordinates; conic sections; and inequalities.

Required Materials

- Textbook:
Paul, Richard: *Essentials of Technical Mathematics with Calculus: Second Edition*
ISBN13: 9780132890915
Publisher: Prentice
- Non-graphing, non-programmable scientific calculator

Prerequisites/Corequisites

None

Course Objectives

Successful students, upon completion of this course, will be able to:

1. Understand Cartesian coordinates
2. Graph functions, including linear, quadratic, and trigonometric functions
3. Explain the concept of a function, both as rule mapping elements of one set to elements of another, and as a set of ordered pairs
4. Explain the difference between domain and range, and find the composition of two functions where applicable
5. Understand one-to-one functions, onto functions, and one-to-one correspondences, and find the inverse of a function where applicable
6. Solve linear equations
7. Understand interval notation, and solve linear inequalities
8. Understand how angles are measured, and convert between radians and degrees
9. Understand the basic trigonometric ratios of acute angles
10. Find all trigonometric ratios for acute, obtuse, reflex, and quadrantal angles
11. Understand the inverse trigonometric functions
12. Use a table of trigonometric values, or a scientific calculator, to find a reference angle
13. Understand reference angles and solve trigonometric equations
14. Convert between polar and rectangular coordinates

Course Structure

Class Structure

There will be three lectures each week, lasting 50 minutes each. Attendance will be taken every day.

Labs

Labs will take place on Mondays at 2:30 P.M. in RC1003. During our lab time, I will answer your questions about assignments, hand out and assess supplementary assignments, and teach you how to use WebWork.

Assessments

Lecture

The fast pace of this course makes regular attendance vital. Material will be briefly reviewed at the end of each week, but each topic will be explained in detail only once. *Your attendance will directly impact your success in this course, and I will consider it the primary measure of your dedication.*

Homework

There will be a written assignment approximately every two weeks, for a total of about 6 assignments. Supplementary assignments will be submitted through Webwork. If an assignment is drawn from the text, it must be completed on paper and submitted to the drop box on the second floor of the Ryan Building two weeks from the date it is assigned. If an assignment takes up more than one sheet of paper, it must be stapled once in the top left-hand corner.

Midterm Exam

The midterm exam will take place in class on Friday 19 October 2018.

Final Exam

The final exam will take place between December 6th and 17th at a date and time to be determined by the Math Department. I will inform you of the date of the exam as soon as it is known. In the meantime, please do not make travel plans for any date earlier than Tuesday 18 December.

Grading Policy

Your final grade will be calculated as follows:

- 15% of your grade will be determined by homework assignments.
- 10% of your grade will be determined by supplementary assignments.
- 25% of your grade will be determined by the midterm exam.
- 50% of your grade will be determined by the final exam.

Your lowest-marked homework assignment, and your lowest-marked supplementary, will be dropped from consideration.

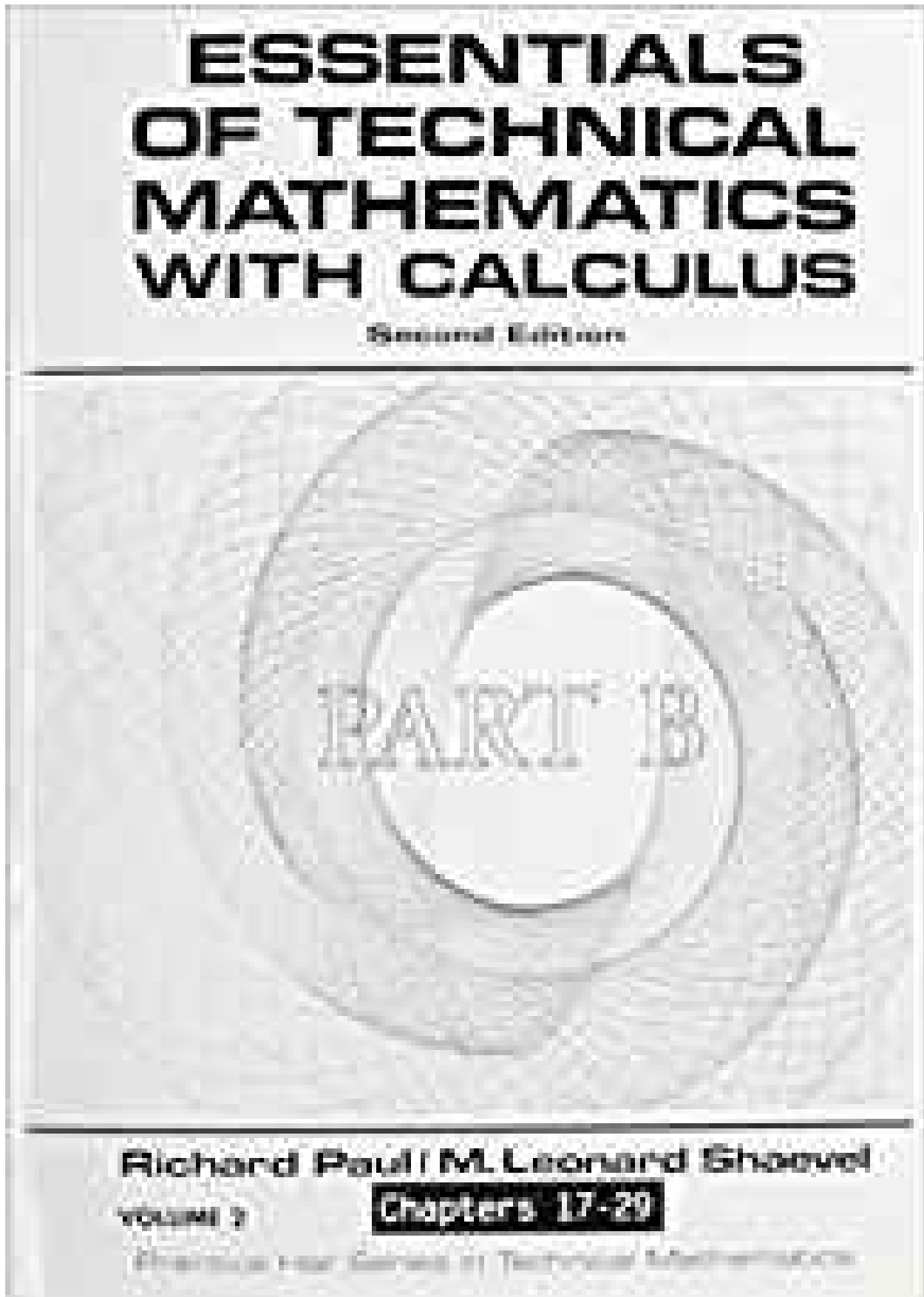


Figure 1: Our ^{4/7}Text for This Course

Course Policies

During Class

I understand that the electronic recording of notes is a necessity, and so computers will be allowed in class. Please refrain from using computers for anything non-class-related. Phones are prohibited as they are rarely useful for anything in the course. Eating and drinking are allowed in class but please refrain from allowing it to affect your work or that of others. Try not to eat your lunch in class.

Attendance Policy

Valid reasons for absence will be accepted before class. Under extenuating circumstances, valid and documented reasons will be accepted after class.

Late Assignment Policy

Late assignments will not be accepted.

Academic Integrity and Honesty

Students are required to comply with the university policy on academic integrity. Don't cheat. For more information, see <https://www.lakeheadu.ca/faculty-and-staff/departments/services/provost-vice-president-academic/academic-integrity-plans-policies/academic-dishonesty-regulations>

Accommodations

Lakehead University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you think you may need accommodations, you are strongly encouraged to contact Student Accessibility Services (SAS) and register as early as possible. For more information, please visit: <http://studentaccessibility.lakeheadu.ca>

Schedule and weekly learning goals

The schedule is tentative and subject to change. The learning goals below should be viewed as the key concepts you should grasp after each week, and also as a study guide before the exam.

Week 01, 09/10 - 09/14: Introduction to Functions

- Welcome to MATH 1051: Functions and Trigonometry
- Review of mathematical operations
- Introduction to Cartesian coördinates
- Introduction to functions

Week 02, 09/17 - 09/21: Working with Functions

- Domain and range
- One-to-one and onto functions
- Composition of functions
- Inverse functions

Week 03, 09/24 - 09/28: Functions in Action

- Linear equations and lines
- Quadratic equations and parabolas
- Applications of linear and quadratic equations

Week 04, 10/01 - 10/05: Applications and Inequalities

- Intervals
- Inequalities
- Graphing inequalities
- Linear programming

Reading Week, 10/08 - 10/12: No classes

Week 05, 10/15 - 10/19: Understanding Angles

- Radian and degree measure
- Similar triangles and basic geometry

Week 06, 10/22 - 10/26: Introduction to Trigonometry

- Sine, cosine, and tangent of an acute angle
- Secondary trigonometric ratios
- Trigonometric ratios for all angles

Week 07, 10/29 - 11/02: Working with Trigonometry

- Applications of trigonometry
- Inverse trigonometric functions
- Midterm Exam

Week 08, 11/05 - 11/09: Trigonometric Equations

- Reference angles
- Solving trigonometric equations

Week 09, 11/12 - 11/16: Applications of Trigonometry

- Word problems and real-world applications of trigonometry

Week 10, 11/19 - 11/23: Polar and Rectangular Coördinates

- Applications of polar coördinates
- Converting between polar and rectangular coördinates

Week 11, 11/26 - 11/30: The Fun Stuff

- Concepts and interesting applications of functions and trigonometry

Week 12, 12/03 - 12/07: Review

- Review for final exam

Important Dates

- First day of classes: Tuesday 4 September 2018
- Final day of classes: Monday 3 December 2018
- Final date to register: Monday 17 September 2018
- Drop date: Friday 9 November 2018
- Examination period: 6–16 December 2018
- Exam contingency date: Monday 17 December 2018
- Friday 19 October 2018: Midterm Exam
- Fall study break (includes Thanksgiving): 8–12 October 2018