

Math Xb Spring 2004

Midterm 2 Review Guide

1 Topics

Midterm 1 will cover §21.1–21.4, §22.1–22.3, and Appendices F and G in our textbook, *Calculus: An Integrated Approach to Functions and Their Rates of Change*. In particular, you will be responsible for the following topics.

CHAPTER 21: DIFFERENTIATION OF TRIG FUNCTIONS

- To know the derivatives of the six trigonometric functions.
- To find derivatives of more complex functions that involve trigonometric functions.
- To solve related rates problems involving trig functions.
- To solve optimization problems involving trig functions.
- To solve curve-sketching problems involving trig functions.
- To know how one can find the derivatives of the inverse trig functions using implicit differentiation.
- To know the derivatives of \sin^{-1} , \tan^{-1} , and \cos^{-1} .

APPENDICES F AND G: L'HÔPITAL'S RULE AND NEWTON'S METHOD

- To recognize the indeterminate forms $\frac{0}{0}$, $\frac{\infty}{\infty}$, $0 \cdot \infty$, 1^∞ , ∞^0 , and 0^0 .
- To evaluate the indeterminate forms $\frac{0}{0}$, $\frac{\infty}{\infty}$, $0 \cdot \infty$, 1^∞ , ∞^0 , and 0^0 using L'Hôpital's Rule.
- To understand how Newton's Method works and how it can go wrong.
- To approximate roots of functions iteratively using Newton's Method.

CHAPTER 22: NET CHANGE, AREA, AND THE DEFINITE INTEGRAL

- To understand the relationship between the definite integral and the questions
 1. Given a rate function, how do we calculate the net change in amount?
 2. How do we calculate the signed area between the graph of a function and the horizontal axis?and to use these relationships to solve problems (such as §22.1 #1, §22.2 #5, and §22.3 #3)
- To approximate a definite integral (or net change or signed area) using left- and right-hand sums.
- To approximate the net change in amount given sample points on a rate function using left- and right-hand sums
- To evaluate a definite integral (or net change or signed area) using geometric area formulas
- To understand the definition of the definite integral

2 Suggested Exercises

In addition to working on the suggested exercises listed below, you are encouraged to review homework problems, worksheets, and labs.

CHAPTER 21

- §21.2 #4, 5, 7, 9, 15
- §21.3 #2, 6, 13, 15, 17 (a)
- §21.4 #6, 8, 9

APPENDICES F AND G

- App. F #1, 2, 5, 12, 13, 18
- App. G #2, 4, 8

CHAPTER 22

- §22.1 #2, 8, 9
- §22.2 #7, 8
- §22.3 #2, 4, 7