

**REVIEW SHEET FOR
MATH 132 MIDTERM #1, SPRING 2003**

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Disclaimer: This review sheet serves to give a **highlight** of the topics to be covered in Midterm #1. It does NOT replace your textbook and/or your lecture notes.

Comments about the practice exams/homework:

- practice exams are on the course website — these are taken verbatim from old exams and may NOT cover the same materials as we do
- YOUR exam is 90 minutes long; the old practice exams are two hours long
- the practice exams are intended to give you an IDEA what the questions are like; your homework problems are intended to give you a chance to LEARN the course materials. The actual exam MAY contain problems DIFFERENT from those in the practice exams and/or homeworks!
- for additional practice: try the problems in the ‘Review Section’ at the end of each chapter

Other comments about your exams:

- any request for makeup/conflict/LDSS/special request: TWO WEEKS OF NOTICE!
- you can use a graphing calculator, but no book/notes
- **SHOW YOUR WORK!**
- pay attention to questions where the functions are given NOT by formulae, but in terms of graphs and/or tables of values (e.g. # 11, #14 in 5.1; #5, #29 in 5.2 — and many OTHER ones!)
- study the examples in your textbook

4.10:

- know your antiderivatives! ($x^n, a^x, 1/x, 1/(x^2 + 1)$, etc.)
- do NOT confuse antiderivatives with derivatives (e.g. an AD of x^n is $x^{n+1}/(n + 1)$, while $(x^n)' = nx^{n-1}$)
- don't forget that CONSTANT!

5.1, 5.2:

- Riemann sums: only need left/right end points with all partitions of equal size
- do NOT confuse left/right end points with over/under estimates

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5.3, 5.4:

- $\int_a^b f(t)dt = \boxed{\text{signed}}$ area bounded by the graph of f from a to b (note: t is a dummy variable!)
- FTC I: $\frac{d}{dx} \int_a^x f(t)dt = f(x)$ — watch out for things like $\frac{d}{dx} \int_a^{x^2} f(t)dt$!!
- FTC II: $\int_a^b F'(t)dt = F(b) - F(a) = \boxed{\text{total change}}$ of F from a to b
- indefinite integral: another name for antiderivatives
- know the table of BASIC integrals on p. 402 – plus OTHERS!
- word problems: velocity/acceleration/distance; total distance vs. total displacement; total change

5.5:

- substitution rule: practice, practice, practice!
- SHOW YOUR SUBSTITUTION STEPS – it helps you earn partial credits in case you made a mistake!
- odd/even functions

6.1:

- to find the area between two curves:
 - (0) sketch the graphs of the two functions!
 - (1) find the points of intersections of the two functions f, g by solving $f(x) = g(x)$. These points of intersections then chop up the range of integration into subintervals.
 - (2) on each of these subintervals, decide which of the two functions lie on top of the other, sometimes it might be easier/necessary to (i) integrate with respect to y and/or (ii) chop up the region into pieces.
- remember that sometimes it's easier to integrate with respect to y

6.2:

- basic formula for volume by slices: $\int_a^b A(x)dx$, where $A(x)$ denotes the area of the cross section at x
 - determine $A(x)$ BASED ON your situation. Do NOT randomly put in a ' πx^2 ' !! For example: if the cross section is a disc: πx^2 ; an annulus: $\pi(R^2 - r^2)$; squares: x^2 , etc.
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