Midterm 2 is Thursday

Covers: 6.3, 6.4, 6.5, 7.1-7.5, 7.7

Allowed

- one sheet of handwritten notes
- TI-30X IIS Calculator
- Pencil (or black pen)

You are allowed to quote any integral from the table in 7.5 of the book (or my table that I posted online). You must show some work to justify your answer for all other integrals.

This is <u>a test on integration</u>. You should know exactly what is coming.

    3 pages: Two "hard" integrals per page

    2 pages: Like things from

           6.3, 6.4, 6.5, 7.7

<u>**ALL**</u> integration methods **will** appear!

Including…

1. by parts
2. trig   - be ready for any case
3. trig sub   - be ready for any case
4. partial fractions
5. substitution

The same algebraic/precalc techniques from homework **will** appear on the test!

1. completing the square
2. dividing polynomials
3. simplifying trig
4. triangle trick for trig
5. simplifying exponentials
6. simplifying roots

Exam 2 cover will look like this…

Name _____

Student ID #_____   Section _____

- This exam consists of a cover, a scratch sheet, five pages of questions, and another scratch sheet. If you put work on either scratch sheet and you want it to be graded, then you must clearly tell us in the problem to "see first scratch page" or "see last scratch page".

- Turn off and stow away all cell phones, smart watches, music players, and other similar devices.

- You may use one $8.5'' \times 11''$ sheet of handwritten notes. You can use only a Texas Instruments TI-30X IIS calculator. No other models are allowed.

- You must **show your work**. You will NOT get credit if there is no or incomplete work, even if your final answer is correct.

- Leave your answer in exact form. Simplify standard trig, inverse trig, natural logarithm, and root values. Examples: you should write $\sqrt{4} = 2$ and $\cos\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}$ and $\ln(1) = 0$ and $\tan^{-1}(1) = \frac{\pi}{4}$.

- *Special Note for Trig Sub*: An answer containing an inverse trig inside of a trig function, such as $\cos(\sin^{-1}(x))$ or $\sin(2\cos^{-1}(x))$, is NOT acceptable, instead show that you can simplify using the triangle method from class.

- You may use directly the integral formulas in the table below. You must **show your work in evaluating any other integrals**, even if they are on your sheet of notes.

Table of Integration Formulas   Constants of integration have been omitted.

1. $\int x^n \, dx = \frac{x^{n+1}}{n+1}$ $(n \neq -1)$ 2. $\int \frac{1}{x} \, dx = \ln|x|$

3. $\int e^x \, dx = e^x$ 4. $\int b^x \, dx = \frac{b^x}{\ln b}$

5. $\int \sin x \, dx = -\cos x$ 6. $\int \cos x \, dx = \sin x$

7. $\int \sec^2 x \, dx = \tan x$ 8. $\int \csc^2 x \, dx = -\cot x$

9. $\int \sec x \tan x \, dx = \sec x$ 10. $\int \csc x \cot x \, dx = -\csc x$

11. $\int \sec x \, dx = \ln|\sec x + \tan x|$ 12. $\int \csc x \, dx = \ln|\csc x - \cot x|$

13. $\int \tan x \, dx = \ln|\sec x|$ 14. $\int \cot x \, dx = \ln|\sin x|$

17. $\int \frac{dx}{x^2 + a^2} = \frac{1}{a} \tan^{-1}\left(\frac{x}{a}\right)$ 18. $\int \frac{dx}{\sqrt{a^2 - x^2}} = \sin^{-1}\left(\frac{x}{a}\right), \quad a > 0$

- **Do not write within 1 centimeter of the edge!** Your exam will be scanned for grading.

Good Luck!