Welcome to Calculus 2! (Math 2300-014)

- Instructor: Jun Hong (PhD student)
- Teaching Assistant: Paul Lessard (PhD student)
- Learning Assistant: Katherine Younglove
- <u>Official Course Website</u>
- <u>Our Website</u>
- Quizzes and lectures will be different across the sections; however, everyone gets the same assignments and exams.
- Read the syllabus before you sign it.
- Sign and turn-in the last page of the syllabus by Friday, August 31st.

Grades

- Projects (5%. Worksheets on Thursdays.)
- Online Homework (5%. Lowest two grades dropped. Check WebAssign.net for the varying due dates on the assignments.)
- If you don't have a WebAssign account, E-mail Jeff (<u>math-help@Colorado.edu</u>). Include your full name, student ID, and the section number (we are section 014).
- Written Homework (10%. 2 dropped. Due Thursdays.)
- In-class Activities and Take-home Work (5%. 2 dropped.)
- 3 Midterm Exams (15% each.)
- Final (30%)

In-class Quizzes

- Daily quizzes using <u>Socrative</u>. (Except Thursdays)
- Bring a tablet or a laptop.
- Graded on participation.
- Use your full name.
- Room Name: HONG5824
- Go to <u>https://socrative.com/</u> and complete the first quiz.

Take-home Quizzes and Handouts

- We'll have either a take-home quiz or a set of handouts.
- Take-home quiz solutions will be posted on the Google Calendar.
- Handout solutions are on the main website.

Take-home Work: Week 1

- There are **three** handouts:
 - Antiderivative Review
 - Practicing mechanics of u/du substitution
 - Identifying Integral Substitutions.
- They are due this Friday, August 31st.
- For the handout titled, "Identifying Integral Substitutions," fully evaluate the integrals.
- For #10, you have to substitute twice.

Lecture Notes

- A skeleton version of each lecture will be available on the Google Calendar before class.
- Completed version will be available after class.

Mathematics Academic Resource Center (MARC)

- Large room: casual setting, lots of desks with power outlets, free tea and coffee.
- Good place to socialize, meet people, and get work done.
- Math tutors are on the perimeter of the room, paid by the university to help students.
- Location: Math 175
- Hours:

Monday – Thursday 9 AM – 8 PM Friday 9 AM – 3 PM

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Expectations

- 1. Respect one another.
- 2. Coming to class means you are here to work. I reserve the right to ask you to leave if you are either disruptive or doing coursework unrelated to calculus.
- 3. You are responsible for clearing up any confusions you might have in class by either seeking help or studying.
- 4. Be honest with your work.
- 5. Take care of your health! 🇞 🛌 🛱 😭

Questions?

- 1. Talk to me after class
- 2. Come to office hours or talk to me during my MARC shift
 - MARC Hour: Fridays 1:00 1:50 PM.
 - MARC Location: Math 175
 - Office Hours: Mondays and Wednesdays 1:00 1:50 PM.
 - Office Location: Math 360
- 3. Email
 - Jun.s.hong@Colorado.edu

Rules of Differentiation (Review)

$$\frac{d}{dx}\left(x^{n}\right) \qquad \qquad \frac{d}{dx}\left(\ln x\right)$$

$$\frac{d}{dx}\left(e^{x}\right)$$

$$\frac{d}{dx}(a^x)$$
 where $a > 0$.

 $\frac{d}{dx}\left(\arctan x\right)$

$$\frac{d}{dx}\left(\arcsin x\right)$$

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Rules of Differentiation (Review)

$$\frac{d}{dx}\left(\sin x\right) \qquad \qquad \frac{d}{dx}\left(\cos x\right)$$

$$\frac{d}{dx}\left(\tan x\right)$$

 $\frac{d}{dx}\left(\cot x\right)$

 $\frac{d}{dx}\left(\sec x\right)$

 $\frac{d}{dx}\left(\csc x\right)$

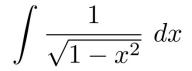
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Rules of Integration (Review) $\int x^n \, dx \text{ where } n \neq -1.$

$$\int x^{-1} dx$$

$$\int e^x \, dx \qquad \qquad \int a^x \, dx \text{ where } a > 0$$

 $\int \frac{1}{1+x^2} dx$



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Rules of Integration (Review)

 $\int \cos x \, dx$ $\int \sin x \, dx$ $\int \csc^2 x \ dx$ $\int \sec^2 x \, dx$

 $\int \sec x \tan x \, dx$

 $\int \csc x \cot x \, dx$

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Indefinite Integral Domino Chain

- Get in a group of 4 or 5 and start matching the top half of a domino with the bottom half of another domino.
- They should form a chain; when finished, they become a loop.
- You got 10 minutes.

5.5 The Substitution Rule (Review)

4 The Substitution Rule If u = g(x) is a differentiable function whose range is an interval *I* and *f* is continuous on *I*, then

$$\int f(g(x))g'(x)\,dx = \int f(u)\,du$$

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5.5 The Substitution Rule (Review) Calculate $\int e^{5x} dx$.

5.5 The Substitution Rule (Review)

Calculate $\int \tan x \, dx$ (Method 1: Splitting)

5.5 The Substitution Rule (Review)

Calculate $\int \tan x \, dx$ (Method 2: Multiply by 1)

Summary

- Reviewed differentiation and integration formulas
- U-substitution examples and techniques