Section 2

TA: Dante
Buhl

Welcome to
Section!

Practice

# Section 2

TA: Dante Buhl

UCSC Math-19B

January 23, 2024

# Plan for Today

Section 2

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Section!

Practice

Topics to Cover

▶ Review Activity

▶ Substitution Method

Section Activity 2

▶ 3 questions

Assignments

▶ Homework 2 (Due Fri, Jan. $26^{th}$)

# Learning Outcomes

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Practice

- ▶ Using FTC P.1 and P.2 to compute integrals.
- ▶ Develop strategies for finding anti-derivatives.
- ▶ Understand how to use and apply u-substitution for integrals/anti-derivatives.

# Review Activity

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# U-Substitution

U-Substitution is an extremely useful method for integration. It relies on using a change of variables (substitution) in order to integrate a simpler function. It is essentially the chain rule for derivatives in reverse.

The Chain Rule.

$$\frac{d}{dx}f(g(x)) = f'(g(x)) \cdot g'(x)$$

# U-Substitution

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$$\int f'(g(x))g'(x)dx$$

$$u = g(x) \rightarrow \frac{du}{dx} = g'(x)$$

$$du = g'(x)dx$$

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

Example:

$$\int 2x \cos x^2 dx$$

$$u = x^2, \rightarrow du = 2xdx$$

$$\int 2x \cos x^2 dx = \int \cos u du = \sin u + c = \sin x^2 + c$$

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# Section Activity 2 (Access Code: )