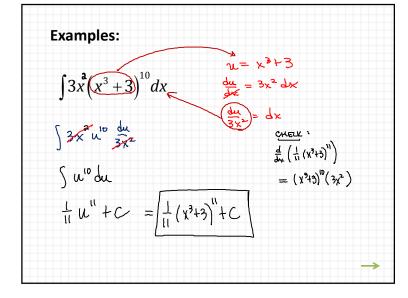
Chapter 5

Section 5.3 – U Substitution

Learning Objectives

- 1. Given a function, recognize when basic integration techniques are not sufficient.
- 2. Given a function, be able to find the antiderivative using **u-substitution** initially when u is picked for you.



Examples:

$$\int 4y\sqrt{1+y^2}dy$$

$$du = 2y dy$$

$$du = dy$$

$$2\int u'^{12}du$$

Examples:

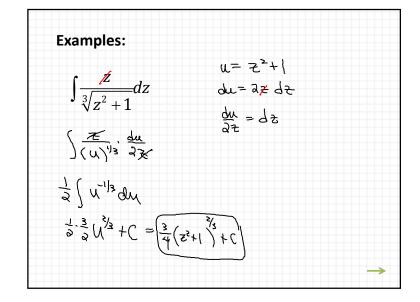
$$u = 20$$

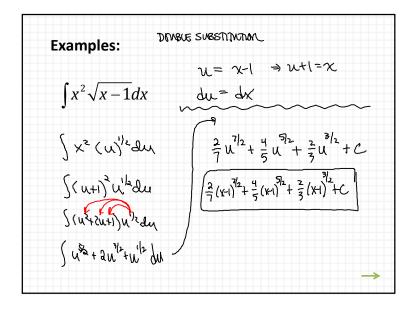
$$\int \sec^2(2\theta)d\theta \qquad du = 2 d\theta$$

$$\int \sec^2(u) \frac{du}{du} = d\theta$$

$$\frac{1}{2} \int \sec^2(u) du$$

$$\frac{1}{2} \tan u + C = \frac{1}{2} \tan(20) + C$$





U Substitution Steps

- 1. Make a choice for u (how?)
 - a. Normally inside another function
 - b. It's derivative gives you something else in the problem
- 2. Find du.
- 3. Substitute u and du into the original problem.
- 4. Evaluate the integral.
- 5. Sub the original variable back in at the end.

Homework/Classwork:

1. Classwork

- a. Section5.2A WS
- b. Section 5.2B WS

2. Homework

- a. Day 1: p. 261 #1-3
- b. Day 2: p. 261 #5-27 odd, 31, 33

Learning Objectives

- 1. Given a function, recognize when basic integration techniques are not sufficient.
- 2. Given a function, be able to find the antiderivative using u-substitution initially when u is picked for you.