Reading Questions 8

Section 7.1 : Example 1

1. The derivative of $\cos(x)$ is $\sin(x)$.

2. The derivative of $f(g(x))$ is $f'(x)g(x) + f(x)g'(x)$.

3. Compute $\int \cos(x)\, dx$.

Section 7.1 Integration by Substitution (Part 1)

Indefinite Integrals

P 1. Which kind of functions would integration by substitution be useful to use to integrate the function?

Theorem

$$\int f'(g(x)) \cdot g'(x)\, dx = f(g(x)) + C$$

P 2. Find $\int 2x \sin(x^2 + 1)\, dx$. Be sure to clearly state your w and dw.

P 3. Find $\int (3x^2 + 1)\sqrt{x + x^3}\, dx$.

P 4. Find $\int \frac{1+e^t}{t+e^t}\, dt$.

Definite Integrals

P 5. Compute $\int_0^4 \frac{e^{\sqrt{t}}}{\sqrt{t}}\, dt$ definite integral. Try using both methods from the lecture.

P 6. Find $\int_0^2 \frac{x}{(1+x^2)^2}\, dx$.

P 7. Find $\int x\sqrt{x + 1}\, dx$.

P 8. Find $\int (x + 7)\sqrt[3]{3 - 2x}\, dx$.