

6.2.1

6.2.1 U-Substitution

Consider $f'(x) = 2x \sin x^2$

What do you notice?

Can you find $f(x)$?

Integration by substitution (U-Substitution)

$$\int 2x \sin x^2 dx$$

Steps

1. Identify the inside function
2. Let u =inside function
3. Find du
4. Get a "match" and substitute (If you can't get a "match" try another u)
5. Integrate
6. Use substitution to get your answer back in terms of x
7. Check by differentiating

Find each indefinite integral

$$\int e^{\cos x} \sin x dx$$

$$\int \sin^3 x \cos x dx$$

$$\int x e^{x^2} dx$$

$$\int x^3 \cos(3x^4) dx$$

6.2.1

$$\int \sqrt{\sec x} \sec x \tan x \, dx$$

$$\int \frac{\ln^4 x}{2x} \, dx$$

$$\int \frac{3 \csc^2 \theta}{\cot \theta} \, d\theta$$

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

$$\int \frac{\sqrt{\ln x}}{4x} \, dx$$

$$\int \frac{dx}{x^2 + 16}$$

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