Integration By Parts

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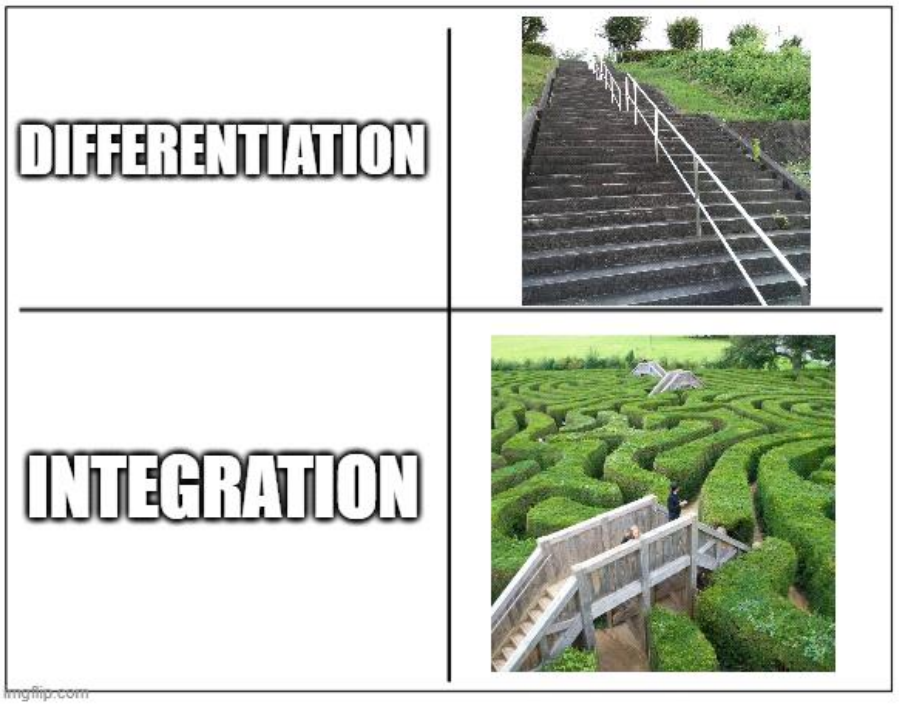

7.1 Integration by Parts

$$\frac{d}{dx}[f(x)g(x)] = f(x)g'(x) + g(x)f'(x)$$

$$\int [f(x)g'(x) + g(x)f'(x)]\,dx = f(x)g(x)$$

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

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

$$\int u\,dv = uv - \int v\,du$$

EXAMPLE 1 Find $\int x \sin x\,dx$.

EXAMPLE 2 Evaluate $\int \ln x\,dx$.

EXAMPLE 3 Find $\int t^2 e^t\,dt$.

EXAMPLE 4 Evaluate $\int e^x \sin x\,dx$.

EXAMPLE 5 Calculate $\int_0^1 \tan^{-1} x\,dx$.