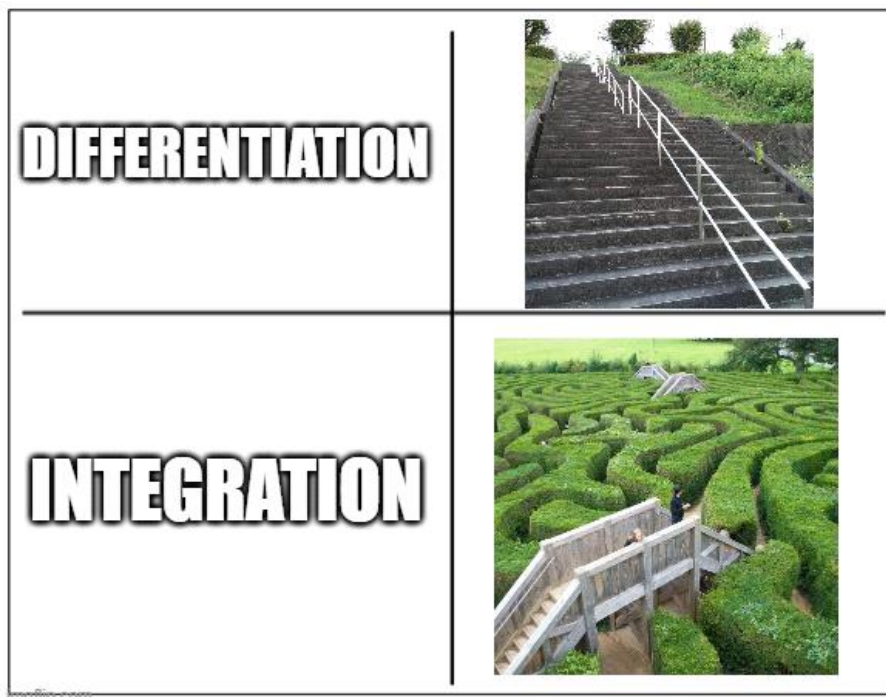


# Integration By Parts

Saturday, 24 August 2024 11:54 pm



## 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  $\int x \sin x \, dx$ .

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

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

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

When you integrate by parts then  
realize you need to integrate by parts  
again



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