
Integration by parts formula:

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

Trigonometric identities:

$$\begin{aligned} \cos^2(x) + \sin^2(x) &= 1 & \sec^2(x) - \tan^2(x) &= 1 & \sin(2x) &= 2 \sin(x) \cos(x) \\ \cos^2(x) &= \frac{1 + \cos(2x)}{2} & \sin^2(x) &= \frac{1 - \cos(2x)}{2} \end{aligned}$$

Derivatives of trig functions.

$$\begin{aligned} \frac{d \sin x}{dx} &= \cos x & \frac{d \tan x}{dx} &= \sec^2 x & \frac{d \sec x}{dx} &= \sec x \tan x \\ \frac{d \cos x}{dx} &= -\sin x & \frac{d \cot x}{dx} &= -\csc^2 x & \frac{d \csc x}{dx} &= -\csc x \cot x \end{aligned}$$

Trigonometric substitution tricks for odd powers of secant and even powers of tangent:

$$\begin{aligned} u &= \sec(\theta) + \tan(\theta) & \sec(\theta)d\theta &= \frac{du}{u} \\ \sec(\theta) &= \frac{u^2 + 1}{2u} & \tan(\theta) &= \frac{u^2 - 1}{2u} \end{aligned}$$