

HANDY DANDY FORMULAS

Integration by parts formula:

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

Trigonometric identities:

$$\cos^2 \theta + \sin^2 \theta = 1$$

$$\sec^2 \theta - \tan^2 \theta = 1$$

$$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$$

$$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$$

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

$$\cos 2\theta = \cos^2 \theta - \sin^2 \theta$$

$$\cos^2 \theta = \frac{1 + \cos 2\theta}{2}$$

$$\sin^2 \theta = \frac{1 - \cos 2\theta}{2}$$

Derivatives of trig functions.

$$\frac{d \sin x}{dx} = \cos x$$

$$\frac{d \tan x}{dx} = \sec^2 x$$

$$\frac{d \sec x}{dx} = \sec x \tan x$$

$$\frac{d \cos x}{dx} = -\sin x$$

$$\frac{d \cot x}{dx} = -\csc^2 x$$

$$\frac{d \csc x}{dx} = -\csc x \cot x$$

Nontrivial integrals of trig functions.

$$\int \tan x dx = -\log |\cos x| + C = \log |\sec x| + C$$

$$\int \sec x dx = \ln |\sec(x) + \tan(x)| + C$$