

A few trigonometric identities

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

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

$$\tan 2\theta = \frac{2\tan \theta}{1 - \tan^2 \theta}$$

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

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

$$\cos(\alpha \pm \beta) = \cos \alpha \cos \beta \mp \sin \alpha \sin \beta$$

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

$$\cos \frac{1}{2}\theta = \pm \sqrt{\frac{1 + \cos \theta}{2}}$$

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

A few derivatives

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

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

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

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

$$\frac{d}{dx} [\sin^{-1} x] = \frac{1}{\sqrt{1-x^2}}$$

$$\frac{d}{dx} [\cos^{-1} x] = -\frac{1}{\sqrt{1-x^2}}$$

$$\frac{d}{dx} [\tan^{-1} x] = \frac{1}{1+x^2}$$

$$\frac{d}{dx} [\csc^{-1} x] = -\frac{1}{|x|\sqrt{x^2-1}}$$

$$\frac{d}{dx} [\sec^{-1} x] = \frac{1}{|x|\sqrt{x^2-1}}$$

$$\frac{d}{dx} [\cot^{-1} x] = -\frac{1}{1+x^2}$$

A few antiderivatives

$$\int \tan u \, du = \ln |\sec u| + C$$

$$\int \sec u \, du = \ln |\sec u + \tan u| + C$$

$$\int \cot u \, du = \ln |\sin u| + C$$

$$\int \csc u \, du = -\ln |\csc u + \cot u| + C$$