Derivatives and Integrals Reference Page-Math 106 D. Benedetto

Derivatives

$\frac{d}{dx} constant = 0$ $\quad \frac{d}{dx}\sin x = \cos x$ $\quad \frac{d}{dx}\cos x = -\sin x$

$\frac{d}{dx}x^n = nx^{n-1}$ Power Rule $\quad \frac{d}{dx}\tan x = \sec^2 x$ $\quad \frac{d}{dx}\sec x = \sec x \tan x$

Identities

$\sin^2\theta + \cos^2\theta = 1$ $\quad 1 + \tan^2\theta = \sec^2\theta$

Antiderivatives

$\int constant\ dx = constant \cdot x + C$ $\quad \int x^n\ dx = \frac{x^{n+1}}{n+1} + C$ (for $n \neq -1$) Power Rule

$\int \cos x\ dx = \sin x + C$ $\quad \int \sin x\ dx = -\cos x + C$

$\int \sec^2 x\ dx = \tan x + C$ $\quad \int \sec x \tan x\ dx = \sec x + C$

Values

$\sin 0 = 0$	$\sin\frac{\pi}{2} = 1$	$\sin\frac{3\pi}{2} = \sin\left(-\frac{\pi}{2}\right) = -1$	$\sin\pi = \sin 2\pi = 0$
$\sin\frac{\pi}{6} = \frac{1}{2}$	$\sin\frac{\pi}{3} = \frac{\sqrt{3}}{2}$	$\sin\frac{\pi}{4} = \frac{\sqrt{2}}{2} = \frac{1}{\sqrt{2}}$	
$\tan 0 = 0$	$\tan\frac{\pi}{4} = 1$	$\tan\frac{\pi}{3} = \sqrt{3}$	$\tan\frac{\pi}{6} = \frac{1}{\sqrt{3}}$
$\cos 0 = 1$	$\cos\frac{\pi}{2} = \cos\frac{3\pi}{2} = 0$	$\cos\pi = -1$	$\cos 2\pi = 1$
$\cos\frac{\pi}{6} = \frac{\sqrt{3}}{2}$	$\cos\frac{\pi}{3} = \frac{1}{2}$	$\cos\frac{\pi}{4} = \frac{\sqrt{2}}{2} = \frac{1}{\sqrt{2}}$	