

Some complex derivatives and antiderivatives

August 23, 2002

1 Logisitic functions

$$\begin{aligned} \frac{d}{dx}(\ln|x|) &= \frac{1}{x} & \int \frac{dx}{x} &= \ln|x| \\ \frac{d}{dx}(e^x) &= e^x & \int e^x dx &= e^x \end{aligned} \tag{1}$$

2 Trigonometric functions

$$\begin{aligned} \frac{d}{dx}(\sin x) &= \cos x & \int \sin x dx &= -\cos x \\ \frac{d}{dx}(\cos x) &= -\sin x & \int \cos x dx &= \sin x \\ \frac{d}{dx}(\tan x) &= \sec^2 x & \int \tan x dx &= \ln|\sec x| = -\ln|\cos x| \\ \frac{d}{dx}(\sec x) &= \sec x \tan x & \int \cot x dx &= \ln|\sin x| = -\ln|\csc x| \\ \frac{d}{dx}(\cot x) &= -\csc^2 x & \int \sec x dx &= \ln|\sec x + \tan x| = \ln\left|\tan\left(\frac{x}{2} + \frac{\pi}{4}\right)\right| \end{aligned} \tag{2}$$