Lecture 26: Antiderivatives and Indefinite Integration

Goal: Reverse the process of differentiation.

$\int kf(x)\ dx = kF(x) + C$	$\int (f(x) + g(x))\ dx = F(x) + G(x) + C$
$\int f(g(x))g'(x)\ dx = F(g(x)) + C$	$\int (f(x) - g(x))\ dx = F(x) - G(x) + C$
$\int x^n\ dx = \frac{1}{n+1}x^{n+1} + C$ (when $n \neq -1$)	$\int \frac{1}{x}\ dx = \ln\lvert x\rvert + C$
$\int e^x\ dx = e^x + C$	$\int e^{kx}\ dx = \frac{1}{k}e^{kx} + C$
$\int \sin x\ dx = -\cos x + C$	$\int \cos x\ dx = \sin x + C$
$\int \sec^2 x\ dx = \tan x + C$	$\int \sec x \tan x\ dx = \sec x + C$
$\int \csc x \cot x\ dx = -\csc x + C$	$\int \csc^2 x\ dx = -\cot x + C$
$\int \frac{1}{\sqrt{1-x^2}}\ dx = \sin^{-1} x + C$	$\int \frac{1}{1+x^2}\ dx = \tan^{-1} x + C$

Table 1: Table of Antiderivatives