Antiderivative Formulas

We will use the notation $\int f(x)dx$ to denote the antiderivative of $f(x)$. In the following formulas, $f(x)$ and $g(x)$ are functions and c is a constant:

$$\begin{aligned}
\int f+g dx &= \int f + \int g \\
\int f-g dx &= \int f - \int g \\
\int cf dx &= c\int f dx \\
\int f'(g(x))g'(x) &= f(g(x))+C
\end{aligned}$$

Formulas for common functions:

$$\int x^a\ dx = \frac{x^{a+1}}{a+1} + C \text{ if } a \neq -1 \qquad \int x^{-1}\ dx = \ln x + C$$
$$\int a^x\ dx = \frac{a^x}{\ln a} + C \qquad \int \ln x\ dx = x\ln x - x + C$$
$$\int \sin x\ dx = -\cos x + C \qquad \int \cos x\ dx = \sin x + C$$
$$\int \tan x\ dx = -\ln|\cos x| + C \qquad \int \cot x\ dx = \ln|\sin x| + C$$
$$\int \sec x\ dx = \ln|\sec x + \tan x| + C \qquad \int \csc x\ dx = \ln|\csc x - \cot x| + C$$
$$\int \sec^2 x\ dx = \tan x + C \qquad \int \csc^2 x\ dx = -\cot x + C$$
$$\int \sec x \csc x\ dx = \sec x + C \qquad \int \csc x \cot x\ dx = -\csc x + C$$
$$\int \frac{1}{\sqrt{1-x^2}}\ dx = \arcsin x + C \qquad \int \frac{1}{x^2+1}\ dx = \arctan x + C$$
$$\int \frac{1}{x\sqrt{x^2-1}}\ dx = \text{ arcsec x } + C$$
$$\int \sinh x\ dx = \cosh x + C \qquad \int \cosh x\ dx = \sinh x + C$$