Antiderivative Rules

Let $k, n$ be constants, with $n \neq -1$. Let $f, g, u$ be functions.

Antiderivative of a Constant:

$$\int k \, dx = kx + C$$

Anti-Power Rule: ($n \neq -1$)

$$\int x^n \, dx = \frac{x^{n+1}}{n+1} + C$$

Antiderivative of $x^{-1}$:

$$\int \frac{1}{x} \, dx = \ln|x| + C$$

Antiderivative of $e^x$:

$$\int e^x \, dx = e^x + C$$

Constant Multiple:

$$\int (k \cdot f(x)) \, dx = k \cdot \int f(x) \, dx$$

Sum/Difference:

$$\int (f(x) \pm g(x)) \, dx = \int f(x) \, dx \pm \int g(x) \, dx$$

Anti-Chain Rules: ($n \neq -1$)

$$\int u^n \cdot u' = \frac{u^{n+1}}{n+1} + C$$

$$\int \frac{u'}{u} = \ln|u| + C$$

$$\int e^u \cdot u' = e^u + C$$