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: $(n \neq -1)$

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

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

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