

Rules for finding antiderivatives

- **Antiderivative of a constant times a function.** For any constant k ,

$$\int kf(x)dx = k \int f(x)dx.$$

- **Sum rule.**

$$\int (f(x) + g(x))dx = \int f(x)dx + \int g(x)dx.$$

- **Power rule.** If $n \neq -1$ then

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

- **General power rule.** For any real number $n \neq -1$,

$$\int [f(x)]^n f'(x)dx = \frac{[f(x)]^{n+1}}{n+1} + C.$$

- **Exponent rule.**

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

- **Logarithm rule.**

$$\int x^{-1} dx = \ln|x| + C.$$

- **Substitution.** Let $G(y)$ be an antiderivative of $g(y)$ then

$$\int g(f(x))f'(x)dx = G(f(x)) + C.$$