

Antidifferentiation

For each problem, find $f(x)$.

1. $f'(x) = x^2$

2. $f'(x) = -\sin x$

3. $f'(x) = x^3 + 3x^2 + 5$

Rules for Integrating (Antideriving)

① $\int 0 dx$

② $\int k dx$

Example: $\int 3 dx$

Example: $\int \pi dx$

③ $\int kf(x) dx$

④ $\int (f(x) \pm g(x)) dx =$

⑤ Power Formulas

$$\int x^n dx$$

Example: $\int (x^5 + x^4 + 3x) dx$

$$\int \frac{1}{x} dx$$

Example: $\int \left(\frac{1}{x} + \frac{1}{x^2} \right) dx$

⑥ Exponential Formulas

$$\int e^x dx$$

$$\int a^x dx$$

• Example: $\int(3e^x + 3^x) dx$

⑦ Trig Formulas

$$\int \cos x dx =$$

$$\int \sin x dx =$$

$$\int \sec^2 x dx =$$

$$\int \csc^2 x dx =$$

$$\int \sec x \tan x dx =$$

$$\int \csc x \cot x dx =$$

• Example: $\int(\cos x - \sin x) dx$