

Handout

INDEFINITE INTEGRALS

Rules: $\int (f(x) + g(x)) dx = \int f(x) dx + \int g(x) dx$ — Sum Rule.

$\int k f(x) dx = k \int f(x) dx$ for all constants k.

~~From now on c is some real number.~~

From here on c is any real number.

List of indefinite integrals

1) ~~$\int k dx$~~

1) $\int k dx = kx + c$

2) $\int x^n dx = \frac{x^{n+1}}{n+1} + c$ ($n \neq -1$)

3) $\int \frac{1}{x} dx = \ln|x| + c$ ($n = -1$ from 2)

4) $\int e^x dx = e^x + c$

5) $\int \ln x dx = x \ln x - x + c$

6) $\int \sin x dx = -\cos x + c$

7) $\int \cos x dx = \sin x + c$

8) $\int \sec^2 x dx = \tan x + c$

9) $\int \sec x \tan x dx = \sec x + c$

10) $\int \operatorname{cosec}^2 x dx = -\cot x + c$

11) $\int \operatorname{cosec}(x) \cot(x) dx = -\operatorname{cosec}(x) + c$

$$12) \int \tan x \, dx = \ln|\sec x| + c$$

$$13) \int \sec x \, dx = \ln|\sec x + \tan x| + c$$

$$14) \int \frac{1}{1+x^2} \, dx = \arctan x + c$$

$$15) \int \frac{1}{\sqrt{1-x^2}} \, dx = \arcsin x + c$$