

Antiderivatives

Definition A function F is called an **antiderivative** of f on an interval I if

$$F'(x) = f(x)$$

for all x in I .

Theorem If F is an antiderivative of f on an interval I , then the most general antiderivative of f on I is

$$F(x) + \mathcal{C}$$

where \mathcal{C} is an arbitrary constant.

Function	Antiderivative	Function	Antiderivative
$c \cdot f(x)$	$c \cdot F(x)$	$\sin x$	$-\cos x$
$f(x) + g(x)$	$F(x) + G(x)$	$\sec^2 x$	$\tan x$
$x^n \ (n \neq -1)$	$\frac{x^{n+1}}{n+1}$	$\sec x \tan x$	$\sec x$
$\frac{1}{x}$	$\ln x $	$\frac{1}{\sqrt{1-x^2}}$	$\arcsin x$
e^x	e^x	$\frac{1}{1+x^2}$	$\arctan x$
$\cos x$	$\sin x$		