Analysis 2 S2

Raphael Nambiar

Version: 9. April 2022

Integrieren

f(x)	f'(x)
\mathbf{x}^{α} mit $\alpha \in \mathbb{R}$	$\alpha x^{\alpha-1}$
sin(x)	cos(x)
cos(x)	- sin(x)
tan(x)	$1 + \tan^2(x) = \frac{1}{\cos^2(x)}$
cot(x)	$-1-\cot^2(x)=-\tfrac{1}{\sin^2(x)}$
e ^x	e ^x
a ^x	In(a) ⋅ a ^x
ln(x)	1 <u>x</u>
$\log_a(x)$	$\frac{1}{\ln(a)x}$
arcsin(x)	$\frac{1}{\sqrt{1-x^2}}$
arccos(x)	$-\frac{1}{\sqrt{1-x^2}}$
arctan(x)	$\frac{1}{1+x^2}$

f(x)	F(x)
x^a mit $a \neq -1$	$\frac{1}{a+1}x^{a+1}+C$
sin(x)	$-\cos(x)+C$
cos(x)	sin(x) + C
$1 + \tan^2(x)$	tan(x) + C
e^{x}	$e^x + C$
a ^x	$rac{1}{\ln(a)}\cdot a^x+C$
$\frac{1}{x}$	ln(x) + C
$\frac{1}{\sqrt{1-x^2}}$	arcsin(x) + C
$-\frac{1}{\sqrt{1-x^2}}$	arccos(x) + C
$\frac{1}{1+x^2}$	arctan(x) + C

Integration durch Substitution

TBD

Partielle Integration

$$u(x) \cdot v(x) - \int u'(x) \cdot v(x) dx$$

Beispiel:
$$u(x)=x;\ v'(x)=e^x$$

$$u'(x)=1;\ v(x)=e^x$$

$$\int x\cdot e^x = x\cdot e^x - \int \cdot e^x dx = x\cdot e^x - e^x + C$$

Integration durch Partialbruchzerlegung

TBD