Analysis 2 S2

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Integrieren

$f(x)$	$f'(x)$
x^α mit $\alpha \in \mathbb{R}$	$\alpha x^{\alpha-1}$
$\sin(x)$	$\cos(x)$
$\cos(x)$	$-\sin(x)$
$\tan(x)$	$1+\tan^2(x) = \frac{1}{\cos^2(x)}$
$\cot(x)$	$-1-\cot^2(x) = -\frac{1}{\sin^2(x)}$
e^x	e^x
a^x	$\ln(a) \cdot a^x$
$\ln(x)$	$\frac{1}{x}$
$\log_a(x)$	$\frac{1}{\ln(a)x}$
$\arcsin(x)$	$\frac{1}{\sqrt{1-x^2}}$
$\arccos(x)$	$-\frac{1}{\sqrt{1-x^2}}$
$\arctan(x)$	$\frac{1}{1+x^2}$

$f(x)$	$F(x)$
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	$\frac{1}{\ln(a)}\cdot a^x+C$
$\frac{1}{x}$	$\ln(\vert x\vert)+C$
$\frac{1}{\sqrt{1-x^2}}$	$\arcsin(x)+C$
$-\frac{1}{\sqrt{1-x^2}}$	$\arccos(x)+C$
$\frac{1}{1+x^2}$	$\arctan(x)+C$

Integration durch Substitution

TBD

Partielle Integration

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

Beispiel:

$$\int x\cdot e^x$$

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

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

Integration durch Partialbruchzerlegung

TBD