Övningsblad

Standardgränsvärden

$\lim_{x\to\infty} \frac{a^x}{x^\alpha} =$		$\lim_{x\to\infty} \frac{a^x}{x^\alpha} =$	
$\lim_{x\to\infty} \frac{x^a}{{}^a\log x} =$		$\lim_{x\to\infty} \frac{x^a}{{}^a\log x} =$	
$\lim_{x\to\pm\infty} \left(1+\frac{1}{x}\right)^x =$		$\lim_{x\to\pm\infty} \left(1+\frac{1}{x}\right)^x =$	
$\lim_{x\to 0} \frac{\sin x}{x} =$		$\lim_{x\to 0} \frac{\sin x}{x} =$	
$\lim_{x\to 0} \frac{\ln(1+x)}{x} =$		$\lim_{x\to 0} \frac{\ln(1+x)}{x} =$	
$\lim_{x\to 0} \frac{e^x-1}{x} =$		$\lim_{x\to 0} \frac{e^x-1}{x} =$	

Derivata av elementära funktioner

$D\, e^x =$		$D\, e^x =$	
$D \ln x =$		$D \ln x =$	
$D\, a^x =$		$D\, a^x =$	
$D\, {}^a\log x =$		$D\, {}^a\log x =$	
$D\, x^\alpha =$		$D\, x^\alpha =$	
$D \sin x =$		$D \sin x =$	
$D \cos x =$		$D \cos x =$	
$D \tan x =$		$D \tan x =$	
$D \cot x =$		$D \cot x =$	
$D \arcsin x =$		$D \arcsin x =$	

$D \arccos x =$		$D \arccos x =$	
$D \arctan x =$		$D \arctan x =$	
$D\, \mathrm{arccot}\, x =$ ¿		$D\, \mathrm{arccot}\, x =$	
Elementära primitiva funktioner			
$\int e^x \, dx =$		$\int e^x \, dx =$	
$\int \frac{1}{x} \, dx =$		$\int \frac{1}{x} \, dx =$	
$\int x^\alpha \, dx =$		$\int x^\alpha \, dx =$	
$\int \cos x \, dx =$		$\int \cos x \, dx =$	
$\int \sin x \, dx =$		$\int \sin x \, dx =$	
$\int \frac{1}{\cos^2 x} \, dx =$		$\int \frac{1}{\cos^2 x} \, dx =$	
$\int \frac{1}{\sin^2 x} \, dx =$		$\int \frac{1}{\sin^2 x} \, dx =$	
$\int \frac{1}{\sqrt{1-x^2}} \, dx =$		$\int \frac{1}{\sqrt{1-x^2}} \, dx =$	
$\int \frac{1}{1-x^2} \, dx =$		$\int \frac{1}{1-x^2} \, dx =$	
$\int \frac{1}{\sqrt{x^2+\alpha}} \, dx =$		$\int \frac{1}{\sqrt{x^2+\alpha}} \, dx =$	

Facit
Standardgränsvärden
$\lim_{x\to\infty} \frac{a^x}{x^\alpha} = \infty$
$\lim_{x\to\infty} \frac{x^a}{{}^a\log x} = \infty$
$\lim_{x\to\pm\infty} \left(1+\frac{1}{x}\right)^x = e$
$\lim_{x\to 0} \frac{\sin x}{x} = 1$
$\lim_{x\to 0} \frac{\ln(1+x)}{x} = 1$
$\lim_{x\to 0} \frac{e^x-1}{x} = 1$
Derivata av elementära funktioner
$D\,e^x = e^x$
$D\ln x = 1/x$
$D\,a^x = a^x \ln a$, $a>0$ och är konstant
$D\,{}^a\log x = \frac{1}{x\ln a}$, $a>0, a\neq 1$, är konstant
$D\,x^\alpha = \alpha\, x^{\alpha-1}$, α är konstant
$D\sin x = \cos x$
$D\cos x = -\sin x$
$D\tan x = \frac{1}{\cos^2 x}$
$D\cot x = \frac{1}{\sin^2 x}$
$D\arcsin x = \frac{1}{\sqrt{1-x^2}}$

$D\arccos x = -\frac{1}{\sqrt{1-x^2}}$
$D\arctan x = \frac{1}{1+x^2}$
$D\text{arccot}\, x = -\frac{1}{1+x^2}$
Elementära primitiva funktioner
$\int e^x\, dx = e^x + C$
$\int \frac{1}{x}\, dx = \ln\lvert x \rvert + C$
$\int x^\alpha\, dx = \frac{x^{\alpha+1}}{\alpha+1} + C$
$\int \cos x\, dx = \sin x + C$
$\int \sin x\, dx = -\cos x + C$
$\int \frac{1}{\cos^2 x}\, dx = \tan x + C$
$\int \frac{1}{\sin^2 x}\, dx = -\cot x + C$
$\int \frac{1}{\sqrt{1-x^2}}\, dx = \arcsin x + C$
$\int \frac{1}{1-x^2}\, dx = \arctan x + C$
$\int \frac{1}{\sqrt{x^2+\alpha}}\, dx = \ln\left\lvert x + \sqrt{x^2+\alpha} \right\rvert + C$