Math 1431, Calculus I Test 4 Review, Spring 2015.

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1 Differentiation and Integration Tables

Assume n, a, and C are constants. $(\dagger) 1 - x^2 > 0$. $(\ddagger) x^2 - 1 > 0$

Function	Derivative of given function
x^n, $n \neq 0$	$n \cdot x^{n-1}$
$\ln(x)$	$\frac{1}{x}$
e^x	e^x
$\sin(x)$	$\cos(x)$
$\cos(x)$	$-\sin(x)$
$\tan(x)$	$\sec^2(x)$
$\sec(x)$	$\sec(x)\tan(x)$
$\cot(x)$	$-\csc^2(x)$
$\csc(x)$	$-\csc(x)\cot(x)$
$\sinh(x)$	$\cosh(x)$
$\cosh(x)$	$\sinh(x)$
$\arcsin(x)$	$\frac{1}{\sqrt{1-x^2}}$
$\arctan(x)$	$\frac{1}{1+x^2}$
$\text{arcsec}(x)$	$\frac{1}{\|x\|\sqrt{x^2-1}}$
a^x,$a > 0$	$a^x \ln(a)$

Figure 1: Differentiation Table

Function	Integral of given function
x^n	$\int x^n \, dx = \begin{cases} \frac{x^{n+1}}{n+1} + C, & \text{if } n \neq -1; \\ \ln\|x\| + C, & \text{if } n = -1. \end{cases}$
e^x	$\int e^x \, dx = e^x + C$
$\cos(x)$	$\int \cos(x) \, dx = \sin(x) + C$
$\sin(x)$	$\int \sin(x) \, dx = -\cos(x) + C$
$\sec^2(x)$	$\int \sec^2(x) \, dx = \tan(x) + C$
$\sec(x)\tan(x)$	$\int \sec(x)\tan(x) \, dx = \sec(x) + C$
$\csc^2(x)$	$\int \csc^2(x) \, dx = -\cot(x) + C$
$\csc(x)\cot(x)$	$\int \csc(x)\cot(x) \, dx = -\csc(x) + C$
$\cosh(x)$	$\int \cosh(x) \, dx = \sinh(x) + C$
$\sinh(x)$	$\int \sinh(x) \, dx = \cosh(x) + C$
$\frac{1}{\sqrt{1-x^2}} (\dagger)$	$\int \frac{1}{\sqrt{1-x^2}} \, dx = \arcsin(x) + C$
$\frac{1}{1+x^2}$	$\int \frac{1}{1+x^2} \, dx = \arctan(x) + C$
$\frac{1}{x\sqrt{x^2-1}} (\ddagger)$	$\int \frac{1}{x\sqrt{x^2-1}} \, dx = \text{arcsec}(x) + C$
a^x,$a > 0$	$\int a^x \, dx = \frac{1}{\ln(a)} a^x + c$

Figure 2: Integration Table