Math cheat sheet Integrals and derivatives

Elementary Function		**Composite Function**	
Function	Derivative	Function	Derivative
$y = k$	$y' = 0$	$y = f(k)$	$y' = 0$
$y = x^n$	$y' = nx^{n-1}$	$y = f(x)^n$	$y' = nf(x)^{n-1} \cdot f'(x)$
$y = \frac{1}{x}$	$y' = -\frac{1}{x^2}$	$y = \frac{1}{f(x)}$	$y' = -\frac{f'(x)}{f(x)^2}$
$y = \sqrt{x}$	$y' = \frac{1}{2\sqrt{x}}$	$y = \sqrt{f(x)}$	$y' = \frac{f'(x)}{2\sqrt{f(x)}}$
$y = e^x$	$y' = e^x$	$y = e^{f(x)}$	$y' = f'(x)\, e^{f(x)}$
$y = a^x$	$y' = a^x \ln(a)$	$y = a^{f(x)}$	$y' = f'(x)\, a^{f(x)} \ln(a)$
$y = \ln x$	$y' = \frac{1}{x}$	$y = \ln(f(x))$	$y' = \frac{f'(x)}{f(x)}$
$y = \log_a x$	$y' = \frac{1}{x \ln(a)}$	$y = \log_a f(x)$	$y' = \frac{f'(x)}{f(x) \ln(a)}$
$y = \sin x$	$y' = \cos x$	$y = \sin(f(x))$	$y' = f'(x) \cos(f(x))$
$y = \cos x$	$y' = -\sin x$	$y = \cos(f(x))$	$y' = -f'(x) \sin(f(x))$
$y = \tan x$	$y' = \sec^2 x = 1 + \tan^2 x = 1/\cos^2 x$	$y = \tan(f(x))$	$y' = f'(x) \sec^2(f(x))$
$y = \cot x$	$y' = -\csc^2 x = -(1 + \cot^2 x) = -1/\sin^2 x$	$y = \cot(f(x))$	$y' = -f'(x) \csc^2(f(x))$
$y = \sec x$	$y' = \sec x \tan x = \sin x/\cos^2 x$	$y = \sec(f(x))$	$y' = f'(x) \sec(f(x)) \tan(f(x))$
$y = \csc x$	$y' = -\csc x \cot x = -\cos x/\sin^2 x$	$y = \csc(f(x))$	$y' = -f'(x) \csc(f(x)) \cot(f(x))$
$y = \arcsin x$	$y' = \frac{1}{\sqrt{1-x^2}}$	$y = \arcsin(f(x))$	$y' = \frac{f'(x)}{\sqrt{1-f(x)^2}}$
$y = \arccos x$	$y' = -\frac{1}{\sqrt{1-x^2}}$	$y = \arccos(f(x))$	$y' = -\frac{f'(x)}{\sqrt{1-f(x)^2}}$
$y = \arctan x$	$y' = \frac{1}{1+x^2}$	$y = \arctan(f(x))$	$y' = \frac{f'(x)}{1+f(x)^2}$
$y = uv$	$y' = u'v + uv'$	$y = u/v$	$y' = (u'v - uv')/v^2$

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