Tables of Derivatives and Antiderivatives

Here's a summary of basic derivative computations and facts we have learned. In this table, k denotes a constant, and f and g are functions:

$(f+g)' = f' + g'$	$(f-g)' = f' - g'$
$(kf)' = kf'$	$(f \cdot g)' = f'g + fg'$
$\left(\frac{f}{g}\right)' = \frac{f'g - fg'}{g^2}$	$\big(f \circ g\big)'(x) = f'\big(g(x)\big) \cdot g'(x)$
$\frac{d}{dx}(k) = 0$	$\frac{d}{dx}\big(x^n\big) = nx^{n-1}$
$\frac{d}{dx}(\sin x) = \cos x$	$\frac{d}{dx}(\cos x) = -\sin x$
$\frac{d}{dx}(\tan x) = \sec^2 x$	$\frac{d}{dx}(\cot x) = -\csc^2 x$
$\frac{d}{dx}(\sec x) = \sec x \tan x$	$\frac{d}{dx}(\csc x) = -\csc x \cot x$

And now we have a bunch of facts about **antiderivatives**, also known as **indefinite integrals**. This table has fewer entries because there are simply no versions of product rule, quotient rule, or chain rule for antiderivatives:

$\int kf(x)\,dx = k\int f(x)\,dx$	$\int \big(f(x) \pm g(x)\big)\,dx = \int f(x)\,dx \pm \int g(x)\,dx$
$\int k\,dx = kx + C$	$\int x^n\,dx = \frac{x^{n+1}}{n+1} + C$ **if** $n \neq -1$.
$\int \sin x\,dx = -\cos x + C$	$\int \cos x\,dx = \sin x + C$
$\int \sec^2 x\,dx = \tan x + C$	$\int \csc^2 x\,dx = -\cot x + C$
$\int \sec x \tan x\,dx = \sec x + C$	$\int \csc x \cot x\,dx = -\csc x + C$