RECITATION: REVIEW OF DERIVATIVE AND INTEGRATION RULES

1. Fill out the table below.

$\frac{d}{dx}(e^x) = e^x$	$\frac{d}{dx}(\ln(x)) = \frac{1}{x}$	$\frac{d}{dx}\left(x^k\right) = kx^{k-1}$ where $k \neq 0$
$\frac{d}{dx}(c) = 0$ where c is a constant	$\frac{d}{dx}(\sin(x)) = \cos(x)$	$\frac{d}{dx}(\cos(x)) = -\sin(x)$
$\frac{d}{dx}(\tan(x)) = \sec^2(x)$	$\frac{d}{dx}(\sec(x)) = \sec(x)\tan(x)$	$\frac{d}{dx}(\arcsin(x)) = \frac{1}{\sqrt{1-x^2}}$
$\frac{d}{dx}(\arctan(x)) = \frac{1}{1+x^2}$	$\frac{d}{dx}(f(x)\cdot g(x)) = f\cdot g' + f'\cdot g$	$\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right) = \frac{g\cdot f' - f\cdot g'}{g^2}$
$\frac{d}{dx}(f(g(x))) = f'(g)\cdot g'$	$\frac{d}{dx}(k\cdot g(x)) = k\cdot g'(x)$ where k is a constant	$\frac{d}{dx}(f(x)+g(x)) = f'+g'$
$\frac{d}{dx}(\csc(x)) = -\csc(x)\cot(x)$	$\frac{d}{dx}(\cot(x)) = -\csc^2(x)$	$\frac{d}{dx}(\lvert x\rvert) = \begin{cases} 1 & x>0 \\ -1 & x<0 \end{cases}$

2. Write the equivalent integral formula *where possible.*

$$\int e^x\,dx = e^x + C$$

$$\int \sec^2(x)\,dx = \tan(x) + C$$

$$\int \frac{1}{x}\,dx = \ln|x| + C$$

$$\int \sec(x)\tan(x)\,dx = \tan x + C$$

$$\int x^k\,dx = \frac{1}{k+1}x^{k+1} + C$$

$$\int \frac{1}{\sqrt{1-x^2}}\,dx = \arcsin(x) + C$$

$$\int \sin(x)\,dx = -\cos(x) + C$$

$$\int \frac{dx}{1+x^2} = \arctan(x) + C$$

$$\int \cos(x)\,dx = \sin(x) + C$$