Name:_____

MA 2320: Quiz 0
Calculus I Review

1. Fill in the table for derivative rules and antiderivative rules.
2. Compute the following derivatives:
   (a) $\frac{d}{dx}[4x^2 - 5x^{-3}]$
   (b) Find $f'(x)$ for $f(x) = \sin(x)\sqrt{x^3 - x}$
   (c) Find $f''(x)$ for $f(x) = e^{x^2}$
3. Find the local maximums and minimums for $f(x) = x^3 - 3x + 2$. Thatt is, find the points where f
4. Compute the following antiderivatives:
   (a) $\int 2x^2 + 1\, dx$
   (b) $\int 3\sqrt[3]{x} - \sin(x)\, dx$
   (c) $\int \frac{3x - x^2 + 1}{2x}\, dx$
   (d) $\int e^x\, dx$
   (e) $\int e^{3x}\, dx$ Hint: use u-substitution here
   (f) $\int 3x\sqrt[3]{x^2 - 1}\, dx$ Hint: use u-substitution here
   (g) $\int \frac{e^x}{1 + e^{2x}}\, dx$ Hint: use u-substitution here. I used $u = e^x$ and I needed antiderivative rule for arctangent.

Derivative Rule	**Antiderivative Rule**
$\frac{d}{dx}\left[x^n\right] = nx^{n-1}$	$\int x^n\,dx = \frac{x^{n+1}}{n+1} + C$ when $n \neq -1$
$\frac{d}{dx}\left[\ln(x)\right] =$	
$\frac{d}{dx}\left[e^x\right] =$	
$\frac{d}{dx}\left[\sin(x)\right] =$	
$\frac{d}{dx}\left[\cos(x)\right] =$	
$\frac{d}{dx}\left[\tan(x)\right] =$	
$\frac{d}{dx}\left[\sec(x)\right] =$	
$\frac{d}{dx}\left[\cot(x)\right] =$	
$\frac{d}{dx}\left[\csc(x)\right] =$	
$\frac{d}{dx}\left[\sin^{-1}(x)\right] =$	
$\frac{d}{dx}\left[\sec^{-1}(x)\right] =$	
$\frac{d}{dx}\left[\tan^{-1}(x)\right] =$	