

Name: _____

MA 2320: Quiz 1
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 $f(x) = x^3 - 3x + 2$.
4. Find the cusp for the function $f(x) = x^{2/3}$.
5. 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
$\frac{d}{dx} [x^n] = nx^{n-1}$	$\int x^n dx = \frac{x^{n+1}}{n+1} + C$ when $n \neq -1$
$\frac{d}{dx} [\ln(x)] =$	
$\frac{d}{dx} [e^x] =$	
$\frac{d}{dx} [\sin(x)] =$	
$\frac{d}{dx} [\cos(x)] =$	
$\frac{d}{dx} [\tan(x)] =$	
$\frac{d}{dx} [\sec(x)] =$	
$\frac{d}{dx} [\cot(x)] =$	
$\frac{d}{dx} [\csc(x)] =$	
$\frac{d}{dx} [\sin^{-1}(x)] =$	
$\frac{d}{dx} [\sec^{-1}(x)] =$	
$\frac{d}{dx} [\tan^{-1}(x)] =$	