Math 181 Honors Quiz 10 Version A

1. Show that if $f(x)$ is differentiable at $x = a$ then $f(x)$ is continuous at $x = a$.

2. [Extra Credit] Give an example of a function which is continuous at $x = a$ but not differentiable at $x = a$.

3. Use the calculus to find the following derivatives:

(i) $\dfrac{d}{dx}\sqrt[3]{x}$

(ii) $\dfrac{d}{dx}\left(\dfrac{\sin^2 x}{3+\cos x}\right)$

(iii) $\dfrac{d}{dx}\arctan(\arctan x)$

(iv) $\dfrac{d}{dx}(1+2+3+4+5)$