Quiz 2 Calculus 1 9/20/2019

1. [5 points possible] Let $f(x) = 1/x$. Use the definition of the derivative to find $f'(x)$.

$f(a) = \frac{1}{a}$

$f'(a) = \lim_{x \to a} \frac{f(x) - f(a)}{x - a}$

$= \lim_{x \to a} \frac{\frac{1}{x} - \frac{1}{a}}{x - a}$

$= \lim_{x \to a} \frac{\frac{a - x}{(xa)(x-a)}}{x - a}$

$= \lim_{x \to a} \frac{-(x-a)}{(x-a)ax}$

$= \lim_{x \to a} \frac{-1}{ax} = \frac{-1}{a^2}$

Excellent!

$\rightarrow$ So $f'(x) = \boxed{\frac{-1}{x^2}}$.