MATH 131 Homework 9
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1. **Let $f(x) = x^{\frac{1}{3}}$ show $f'(x) = \frac{1}{3}x^{\frac{-2}{3}}$**

   For $a \neq 0$

$$f'(x) = \lim_{x \to a} \frac{f(x) - f(a)}{x - a} = \frac{x^{\frac{1}{3}} - a^{\frac{1}{3}}}{x - a}$$

2. **Let $f(x) = x^2$ rational and $f(x) = 0$ irrational.**

   Prove f is continuous at $x = 0$

   f is continuous if $\forall \epsilon > 0 \exists \delta : f(x) - f(y)$

   Prove f is not continuous $\forall x \neq 0$

   Prove f is differentiable at $x = 0$.

3. **Placeholder**
4. **Placeholder**
5. **Placeholder**
6. **Placeholder**
7. **Placeholder**
8. **Placeholder**