Assignment 4: Due Mon Sept 18th

$$f(x) = \sqrt[3]{x} - \sqrt[9]{x}$$

Give the following answers using interval notation.

-On what interval(s) is f(x) defined? (What is its domain?)

-On what interval(s) is f(x) continuous? Why?

-On what interval(s) is f(x) differentiable? Why? A graph is a clue, but not a proof; prove your answer using the definition of differentiability.

f(x) is defined: $(-\infty, \infty)$

f(x) is continuous because it is a difference of two roots.

$f(x) = x^{1/3} - x^{1/9}$

$f'(x) = \frac{1}{3x^{2/3}} - \frac{1}{9x^{8/9}}$

$f'(x) =$ DNE when $x = 0$

$\therefore$ the interval of diff'able is $(-\infty, 0) \cup (0, +\infty)$ □