Math 181 Honors Quiz 6 Version A

1. State the definition of derivative in terms of limits.

2. Find all x such that $x^2 > 2x - 1$.

3. Convert the repeating decimal $1.5\overline{24}$ to a fraction.

4. The limit laws are

(0) $\lim\limits_{x\to a} c = c$

($\frac{1}{2}$) $\lim\limits_{x\to a} x = a$

(1) $\lim\limits_{x\to a} cf(x) = c \lim\limits_{x\to a} f(x)$

(2) $\lim\limits_{x\to a} \big(f(x) + g(x)\big) = \lim\limits_{x\to a} f(x) + \lim\limits_{x\to a} g(x)$

(3) $\lim\limits_{x\to a} \big(f(x)g(x)\big) = \lim\limits_{x\to a} f(x) \lim\limits_{x\to a} g(x)$

(4) $\lim\limits_{x\to a} \dfrac{1}{f(x)} = \dfrac{1}{\lim\limits_{x\to a} f(x)}$ provided $\lim_{x\to a} f(x) \neq 0$

(5) $\lim\limits_{x\to a} f\big(g(x)\big) = f\Big(\lim\limits_{x\to a} g(x)\Big)$ if f is continuous at $\lim\limits_{x\to a} g(x)$.

(i) Let $f(x) = 3/x$. Use the limit laws and/or ϵ-δ to verify that $f'(x) = -3/x^2$.