QUIZ 2 - MATH 151 Friday, September 23

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Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Recall that the function $v(x) = |x|$ may also be defined equivalently as a piecewise defined function by $v(x) = \begin{cases} -x, & \text{if } x < 0 \\ x, & \text{if } x \geq 0 \end{cases}$

   Consider the function $f(x) = \frac{1}{x} - \frac{1}{|x|}$.

   (a) Provide an equivalent definition for f as a piecewise defined function. Write down your answer cleanly in symbols (no verbal descriptions, please).

   (b) Draw carefully the graph of $y = f(x)$.

   (c) Find the $\lim_{x \to 0^+} f(x)$.

   (d) Is f continuous at $x = 0$? Please, provide in a **short precise** sentence your reasons for an affirmative or a negative answer, explaining why the conditions in the definition of continuity at a point hold or fail, respectively.