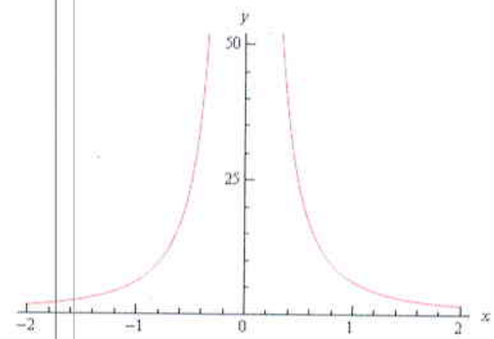
Math 1151, Quiz #3, Fall 2014   Name KEY

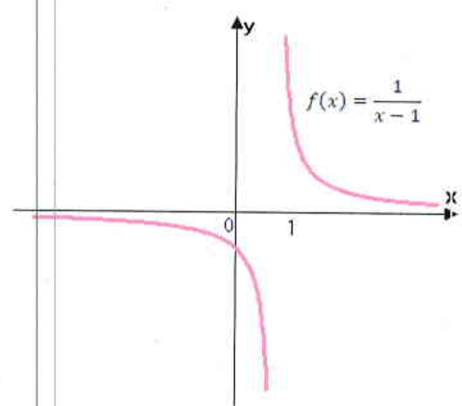
Instructions: Show all work. Answers without work may only receive partial credit. If you are asked for an explanation, explain as completely as possible. Use exact answers unless specifically asked to round.

1. Use the graph to find the indicated limit.

   a. $\lim_{x \to 0} \frac{1}{x^2} = \infty$



   b. $\lim_{x \to 1^-} \frac{1}{x-1} = -\infty$



2. Evaluate the limit $\lim_{x \to 3} \frac{(x-1)(x-2)}{x-3}$ or state that it does not exist.

   DNE

3. Evaluate the limit $\lim_{x \to \infty} \frac{\cos(x^5)}{\sqrt{x}}$. $= 0$

4. Evaluate the limit $\lim_{x \to -\infty} \frac{6x^2-9x+8}{3x^2+2}$. $= \lim_{x \to -\infty} \frac{6\cancel{x^2}}{3\cancel{x^2}} = 2$

5. Evaluate the continuity of $f(x) = \begin{cases} \frac{1}{2}x+2, & x \leq 2 \\ -x+5, & x > 2 \end{cases}$. Be sure to check all three conditions of continuity.

① $f(2) = \frac{1}{2}(2)+2 = 1+2 = 3$

② $\lim\limits_{x \to 2^-} f(x) = \lim\limits_{x \to 2^-} \frac{1}{2}x+2 = 3$

$\lim\limits_{x \to 2^+} f(x) = \lim\limits_{x \to 2^+} -x+5 = -2+5 = 3$

$\therefore \lim\limits_{x \to 2} f(x) = 3$

③ $f(2) = \lim\limits_{x \to 2} f(x)$

Since each piece is continuous on its domain and it's continuous at $x=2$, the function is continuous everywhere.