Math 1151

Name:_____

Test 1

50 points

General Directions: Answer each question thoroughly. Incorrect answers with work shown may receive partial credit, but unsubstantiated answers will receive NO CREDIT. I do not want (decimal) approximations unless specifically asked for. I want the exact numbers. Justify all claims using calculus concepts (i.e., theorems, definitions, etc.). I am looking for mathematical logic and reasoning. Show all of your work!! Explain! Explain! Explain! Graphing calculators are NOT allowed.

1. (25 points) Analyze the function $f(x) = \dfrac{x^2 - 9x + 8}{\sqrt{x^4 - 2x^3 + x^2}}$. That is, state the domain, determine the intercepts, identify discontinuities and classify them as removable or non-removable, and determine all asymptotes of the function.

2. (25 points) Analyze the function $g(x) = \begin{cases} \dfrac{1}{x+4} & x < -2 \\ x^2 & -2 \leq x \leq 2 \\ x+2 & 2 < x < 4 \\ -\dfrac{2x}{x+7} & x \geq 4 \end{cases}$. That is, state the domain, determine the intercepts, identify discontinuities and classify them as removable or non-removable, and determine all asymptotes of the function.