Main Exercises Week 6

MATH 130: Calculus I, Section 2 & 3 Your Name (Print): _____

Follow the general guidelines for the Main Exercises assignments (the salmon colored handout). Be sure to **staple** together your pages if you have more than one, and include your **name** at the top. Neatness is appreciated, makes a good first impression, and can earn you a bonus point!!!

Due: at the beginning of class on Friday, February 23rd

Remember: Your write-up should be **your own**. You may discuss these problems with others, but **you should be alone when you write them up**, using only outlines of any group or Intern discussions. EXPLAIN and SHOW YOUR WORK!!! Final answers will not receive full credit without supportive explanations. You may use your own paper on which to write these up.

1. Find the horizontal asymptotes of $f(x) = \dfrac{12x^3 + x - 5}{16x^3 + \sqrt{64x^6 - 9x^4 + 2}}$, or justify that it has none. Explain your work carefully. If f has a horizontal asymptote, state it explicitly.

2. Let $f(x) = \dfrac{\frac{1}{3} - \frac{1}{2x+1}}{x - 1}$.

   (a) Determine where the function is NOT continuous. Explain in a full sentence why you know this. (Hint: You may want to do some manipulation to start this question!)

   (b) Given your result in (a), determine what kinds of discontinuities each of your answers is. Be sure to use the definitions of the different kinds of discontinuities with limits and function values!

   (c) True or False: f is right continuous at 1. Explain your answer in a complete sentence or two.