Math 142, Problem Set #10
(due **in class** Fri., 4/18/14)

Note: To get full credit for a problem, it is not enough to give the right answer; you must explain your reasoning.

Also note that this is a two-page assignment.

Stewart, section 8.5, problems 12, 24, 36.
Stewart, section 8.6, problems 4, 12, 32.
Stewart, section 8.7, problems 2, 4, 50, 54, 62.
Stewart, section 8.8, problems 16(ab), 30.

Also:

A. Consider the infinite series $1 + 1/2 - 1/4 + 1/8 + 1/16 - 1/32 + 1/64 + 1/128 - 1/256 + \ldots$ where the nth term is $-1/2^{n-1}$ if n is a multiple of 3 and $+1/2^{n-1}$ otherwise. Is this sum absolutely convergent, conditionally convergent, or divergent?

B. Consider the infinite series $1 + 1/2 - 1/3 + 1/4 + 1/5 - 1/6 + 1/7 + 1/8 - 1/9 + \ldots$ where the nth term is $-1/n$ if n is a multiple of 3 and $+1/n$ otherwise. Is this sum absolutely convergent, conditionally convergent, or divergent? (Hint: Apply the Limit Comparison Test to $(1 + 1/2 - 1/3) + (1/4 + 1/5 - 1/6) + (1/7 + 1/8 - 1/9) + \ldots$.)

C. Consider the infinite series $1 - 1/2 + 1/3 - 1/4 + 1/5 + 1/7 - 1/6 + 1/9 + 1/11 + 1/13 + 1/15 - 1/8 + \ldots$ (a rearrangement of the aternating harmonic series) in which the blocks of positive terms consist of 1 term, 1 term, 2 terms, 4 terms, 8 terms, 16 terms, etc. Is this sum absolutely convergent, conditionally convergent, or divergent? (Hint: See Example 8.2.7.)

D. Let $f(x) = |x|$.

   (a) Find the Taylor series for f centered at $a = 1$. What is the radius of convergence of this series, and for what values of x does the series converge to $f(x)$?

   (b) Same as part (a), but with $a = -1$.

(c) Same as part (a), but with $a = 0$. If the question does not make sense in this case, explain why!

Please don't forget to write down **who you worked on the assignment with** (if nobody, then write "I worked alone"), **and how much time you spent on each problem** (this doesn't need to be exact).