Test 3 Review

Dr. Graham-Squire, Spring 2013

•The test will cover sections 8.1-8.6.

•To study, you should look over your notes, labs, rework HW problems, quizzes, and problems from the notes, as well as work out the practice problems given for each section. The Review Questions at the end of Chapter 8 will also be good practice (True/False (page 629) #1-9, Exercises # 1-34).

•The questions from my website that match the material on this test are Test 3: #2-7, and Test 4: #1.

•Calculators <u>can</u> be used on this test, but will not be necessary for most (if not all) questions.

•Some practice problems to work on:

1. Determine whether the sequence is convergent or divergent. If convergent, find the limit.
   (a) $a_n = \dfrac{n^3 + n^2 \cos n}{n^3}$
   (b) $b_n = \dfrac{\sqrt[3]{n}}{\ln n}$
2. Determine if the series is convergent or divergent. If it is convergent, find the limit. Make sure you state which convergence/divergence test you use (or if no test, then explain your reasoning).
   (a) $\displaystyle\sum_{n=1}^{\infty} \frac{3^n}{5^{n+2}}$
   (b) $\displaystyle\sum_{n=1}^{\infty} \left(\frac{1}{n} - \frac{1}{n+2} \right)$ Note: You may need to use a partial fraction decomposition.
   (c) $\displaystyle\sum_{n=1}^{\infty} \frac{3n^2 + 8}{(10n+1)^2}$
3. Test the series for convergence or divergence. If it converges, state whether it is absolutely convergent or not.
   (a) $\displaystyle\sum_{n=2}^{\infty} \frac{(-5)^n - 7}{4^n}$
   (b) $\displaystyle\sum_{n=1}^{\infty} (-1)^{n+1} \frac{\sqrt[3]{n^4} + 10}{n^2}$
   (c) $\displaystyle\sum_{n=1}^{\infty} (-1)^n \frac{n^4}{3^n}$
4. (a) Find the sum of $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n^4}$ correct to four decimal places. (b) How would you find the approximation if it was a 1 in the numerator instead of $(-1)^{n+1}$ (That is, how would you figure out how many terms you need to add up)?

5. Find the radius of convergence and interval of convergence of the series $\sum_{n=1}^{\infty} \frac{(x+2)^n}{n(4^n)}$

6. Find a power series representation for $\frac{-2}{(1-x)^3}$ and its radius of convergence.