MiniTest 4 Review

Dr. Graham-Squire, Spring 2013

•The test will cover sections 8.7, 8.8, 9.1, 9.6 and 9.7.

•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 Chapters 8 (Exercises # 35-45, 47-49) and 7 (True/False # 1-4, Exercises 5-8) will also be good practice.

•The questions from my website that match the material on this test are Test 4: #2 and 3. I have no test questions for the Chapter 9 material.

•Calculators are necessary for this test, though there may be some questions where you cannot have calculators.

•Some practice problems to work on:

1. Find the Maclaurin series for the functions $f(x) = e^{x^2}$ and $f(x) = x \sin x$.
2. Let $f(x) = x^{2/3}$.
   (a) Approximate f by a Taylor polynomial with degree 3 at $a = 1$.
   (b) Use Taylor's inequality to estimate the accuracy of the approximation $f(x) = T_3(x)$ when x is in the interval $[0.8, 1.2]$.
   (c) Check the accuracy of your result from (b) by graphing $|R_3(x)|$.
3. Determine if the following points are collinear, and explain your answer:

$$P = (2, -1, 5) \qquad Q = (8, 3, 13) \qquad R = (-7, -7, -7).$$

4. Sketch the surface given by the equation $4x^2 - 9y^2 = -4z^2$.
5. (a) The point $(2, 2\pi/3, -2)$ is in cylindrical coordinates. Convert it to spherical coordinates.
   (b) Find an equation in rectangular coordinates for the equation $z = r^2 \cos^2 \theta$ given in cylindrical coordinates. Sketch and/or describe the graph.