Problem Set 5 Calc 2 Due 4/30/2003

Each problem is worth 5 points. For full credit provide complete justification for your answers.

1. Problem #26 in Stewart section 11.2.

2. Find two geometric series which converge to 2.

3. We discussed in class the formula for an infinite geometric series. If you believe that, you can use it to obtain the formula for a finite geometric series as follows:

a) Find the sum of a geometric series with first term a and with the ratio of successive terms r.
b) Express the $(n + 1)^{st}$ term in that series.
c) Find the sum of a geometric series starting with the term you found in b) and with ratio r.
d) Explain how to combine your results from parts a) and c) to obtain the sum of the first n terms.

4. We discussed in class the standard Cantor set, obtained by starting with a segment of length 1 and removing its center third, repeating with the remaining segments, and so on. Consider dividing a segment into fifths and removing the second and fourth fifths, then repeating indefinitely – express the total amount removed as a series and find its sum.

4. Problem #14 in Stewart Chapter 11 Problems Plus, p. 780.