Homework Assignment 8: Due at the beginning of class 2/25/02

Questions 1-5 of this assignment will always refer to the infinite series:

$$\sum_{k=1}^{\infty}\left(\frac{1}{k}-\frac{1}{k+1}\right).$$

1. Complete the entries in the table given below. One option here is to use a graphing calculator. For a reminder of the appropriate calculator commands to use, see the Appendix to this homework assignment.

Number of terms added	5	10	100	500	999
Total so far					

NOTE: You should hand in a completed table as part of your homework assignment.

2. Write out the sum that you need to evaluate to find the total of the first **ten** terms of the series, and simplify as much as possible.

3. Find an equation that gives the "total so far" (or "partial sum") when the first N terms of the series are added together. (You can use the table from Question 1 to check the validity of your equation.) The only variable in your equation should be N.

4. By studying the limiting value of the "total so far" (or "partial sum") it is possible to decide whether a series converges or diverges. In a paragraph, explain:

- what it means for a series to "converge" or "diverge," and,

- how you can use the "total so far" (or "partial sum") to decide whether a series converges or diverges.

5. Does the infinite series in this homework assignment converge or diverge? If you believe that the series converges, what value does it converge to?