Collected Homework: The Method of Gauss and More!

Math 110 Section 2
Due February 6, 2008

You may work with someone or on your own to do this assignment. If you do work with someone, please indicate that you did so. Each person should write his or her own assignment. Please be neat and if you have more than one page, staple your work.

1. Find each sum. Solve the problems using the method of Gauss. Show your method, don’t just give an answer!
   a) $1 + 2 + 3 + 4 + \cdots + 31$
   b) $3 + 5 + 7 + 9 + \cdots + 41$
   c) $2 + 5 + 8 + 11 + \cdots + 59$
   d) $5 + 2 + (-1) + (-4) + \cdots + (-37)$

2. Explain the difference between the phrases “the first 100 even numbers” and the “even numbers from one to 100”. Find both sums.

3. This problem is about inductive reasoning. WithOUT using the method of Gauss, consider finding the sum of the first $n$ odd integers. Write down the sums of the first few numbers, noting the totals as you add successive numbers. For example, $1+3=4$ and $1+3+5=9$, and so on.
   a) What pattern(s) do you discover in the list? If necessary, explore a few more examples.
   b) Use your pattern to predict the sum of the first 50 odd integers.
   c) Use your pattern to predict the sum of the first 100 odd integers.
   d) Check your work using the method of Gauss.