MTH 110
Quiz 1
Summer 2008

Show all work in a neat and organized fashion. Clearly indicate your answers.
50 points possible.

2. (5 pts.) Identify an apparent pattern in the sequence of numbers. Use this pattern to find the next few numbers.

5 6 5 6 7 5 6 7 _____ _____ _____ _____ _____ 9

3. (5 pts.) Identify an apparent pattern in the sequence of numbers. Use this pattern to find the next few numbers.

3 5 8 12 _____ _____ _____ _____ _____ 57

4. (5 pts.) Fill in the blanks with the numbers that complete the sequence. (Suggestion: Look at the *third* differences.)

2 4 7 19 _____ _____ 189

5. (5 pts.) Find $(x + y)^6$.

6. (5 pts.) A full-time employee who works 40 hours per week earns $14.18 per hour. Without using a calculator, estimate that person's annual income. Briefly explain how you found your estimate. (You may double-check with a calculator, if you wish.)

7. (5 pts.) On a separate page is a bar graph showing how many people per 100 spelled various difficult words correctly.

In a group consisting of 2390 randomly selected people, estimate how many more people can correctly spell *millennium* than *minuscule*. Briefly explain how you found your estimate.

8. (5 pts.) On a separate page is a bar graph showing the amount of municipal recycling in New York State (Source: "Where Will the Garbage Go? 2002," New York State Assembly, Legislative Commission on Solid Waste Management, Albany, NY, http://assembly.state.ny.us/comm/SolidWaste/20031114/, retrieved 6/16/08.)

Use the graph to predict the amount of municipal recycling (in thousands of tons) in 2012. Briefly explain how you found your estimate.

9. (5 pts.) (Demonstration Problem—Canoe Problem for Six People.) Six people are fishing from a canoe. The seats in the canoe are just wide enough for one person to sit on, and the center seat is empty. The three people in the front of the canoe want to change seats and sit in the back of the canoe, and the three people in the back of the canoe want to sit in the front. Because the canoe is so narrow, only one person may move at a time. A person changing seats may move to the next empty seat, or step over one other person to reach an empty seat. Any other move will capsize the canoe.

Use red and white chips to demonstrate the solution to the instructor.

10. (5 pts.) (Canoe Problem for Sixteen People.) Suppose 16 people are in the canoe instead of 6.

What is the minimum number of moves needed to exchange the people in the front with those in the back? What is the sequence of moves which does it?