MTH 110
Quiz 1
Summer 2007

Show all work in a neat and organized fashion. Clearly indicate your answers. 25 points possible.

1. (2 pts.) The given statement is false. Prove it is false by showing a counterexample.

If a number is multiplied by itself, the result is odd.

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

8 12 16 20 24 ____ ____ ____ ____ ____ ____ ____ ____

3. (4 pts.) The numbers 1, 3, 6, 10, 15, and so on, are called triangular numbers.

Find the pattern in the1st differences by completing the row labelled "1st Difference." Then write the five triangular numbers that follow 15.

Term	1	3	6	10	15	___	___	___	___	___
1st Difference	____	____	____	____	____	____	____	____	____	

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

Term Number	1	2	3	4	5	6	7
Term	5	7	10	18	_____	____	112

5. (5 pts.) To travel by train from Westville to Eastville, you must go through Centerville. See the map and the scale.

(a) Estimate the distance by train from Westville to Eastville (via Centerville).

(b) If a train travels at an average rate of 30 miles per hour, estimate the travel time from Westville to Eastville (via Centerville).

6. (4 pts.) To estimate the number of bass in a lake, wildlife biologists tagged 70 bass and released them into the lake. Later they netted 135 bass and found that 43 of them were tagged. Approximately how many bass are in the lake?

7. (4 pts.) (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.

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