

MTH 110
Quiz 1
Summer 2010

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

1. (3 pts.) Identify an apparent pattern in the sequence of numbers. Use this pattern to fill in the blanks with the numbers that complete the sequence.

3 12 21 30 _____ _____ _____ _____ 75

2. (3 pts.) Identify an apparent pattern in the sequence of numbers. Use this pattern to fill in the blanks with the numbers that complete the sequence.

6 10 17 27 40 _____ _____ _____ _____ 150

3. (3 pts.) Fill in the blanks with the numbers that complete the sequence. Suggestion: Look at the *third* differences.

2 7 14 27 _____ _____ 142

4. (3 pts.) (Canoe problem for 18 people, 9 on each side.)

There are 18 people fishing from a very long but very narrow “canoe.” The seats in the canoe are just wide enough for one person to sit on, and the center seat is empty. The 9 people in the front of the canoe want to change seats and sit in the back of the canoe, and the 9 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 people in the front with those in the back? What is the sequence of moves which does it?

5. (2 pts.) (Demonstration: Canoe problem for 8 people, 4 on each side.)

Consider the canoe problem above, but with a total of 8 people, 4 on each side. Determine the sequence of moves needed to exchange the people in the front with those in the back, using the minimum number of moves. Demonstrate the solution to the professor, using poker chips.

6. (3 pts.) Expand $(r + z)^7$.
7. (1 pt.) Express the fraction $\frac{4}{5}$ as a percent.
8. (1 pt.) Express the fraction $\frac{3}{8}$ as a percent.
9. (1 pt.) Express the decimal 0.53 as a percent.
10. (1 pt.) Express the decimal 2.73 as a percent.
11. (1 pt.) Express the decimal 200 as a percent.
12. (1 pt.) Express the percent 4% as a decimal.
13. (1 pt.) Express the percent $\frac{3}{8}\%$ as a decimal.
14. (1 pt.) Express the percent $38\frac{1}{2}\%$ as a decimal.