

Math 110
Quiz 6
Summer 2009

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

1. (10 pts.) A small country has 57 seats in the congress, divided among four states according to their respective populations. The population of each state, in thousands, is given in the following table.

State	A	B	C	D
Population (in thousands)	2280	305	2520	2020

(a) Apportion the 57 seats using Hamilton's method.

(b) Suppose the number of seats is increased from 57 to 58. Use Hamilton's method to apportion the 58 seats.

(c) Which paradox occurs? Explain briefly.

2. (3 pts.) In how many ways can the digits in the number 156655196651 be arranged?

3. (3 pts.) Ten bands have volunteered to perform at a benefit concert, but there is only enough time for four of the bands to play. How many lineups are possible?

4. (3 pts.) Eight acts are scheduled to perform in a variety show. How many different ways are there to schedule their appearances?

5. (3 pts.) You are taking a multiple-choice test that has seven questions. Each of the questions has three answer choices, with one correct answer per question. If you select one of these three choices for each question and leave nothing blank, in how many ways can you answer the questions?

6. (3 pts.) A popular brand of pen is available in five colors (red, green, blue, black, or orange) and three writing tips (fine, medium, or bold). How many different choices of pens do you have with this brand?