

Math 110
Quiz 5
Summer 2009

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

1. (10 pts.) The preference table for an election is shown.

Number of Votes	60	44	40	24	4
1st choice	D	A	B	C	C
2nd choice	C	B	A	A	B
3rd choice	B	C	C	B	D
4th choice	A	D	D	D	A

- (a) Suppose the plurality-with-elimination method is used. Who is the winner?
- (b) Suppose that candidate D drops out, but the winner is still chosen using the plurality-with-elimination method. Who is the winner?
- (c) Is the irrelevant alternatives criterion satisfied? Using one or more complete sentences, explain your answer.

2. (10 pts.) A country is composed of four states, A, B, C, and D. The population of each state, in thousands, is given in the following table.

State	A	B	C	D
Population (in thousands)	712	570	1162	984

According to the country's constitution, the congress will have 50 seats, apportioned among the four states according to their respective populations.

- (a) Find the standard divisor, in thousands. How many people are there for each seat in congress?
- (b) Find each state's standard quota.
- (c) Find each state's lower quota.
- (d) Find each state's upper quota.
- (e) Use Hamilton's method to find each state's apportionment of congressional seats.

3. (5 pts.) A country is composed of six states, A, B, C, D, E, and F. The population of each state, in thousands, is given in the following table.

State	A	B	C	D	E	F
Population (in thousands)	454	892	676	912	1052	1670

Use Adams's method with a modified divisor of $d = 32$ to apportion 180 seats among the states. (Show the modified quotas as part of your work.)