

Math 1007 Fall 2025
Mathematics and Politics
Homework 6 Due on Blackboard
Wednesday, October 15 at 12:45 PM

Name:

Make sure to explain why all your answers are correct! Remember that you should be making short persuasive arguments. (This explanation can take the form of showing calculations, or of a couple sentences of writing, depending on the question.)

- (1) Let $h = 10$ and suppose we have four states with populations $p_1 = 1200$, $p_2 = 1300$, $p_3 = 1600$, and $p_4 = 5900$.
 - (a) What is the standard divisor for this apportionment?
 - (b) What is the Hamilton apportionment?
 - (c) If we take $d = s$, how many seats would Jefferson's method allocate?
 - (d) Compute the next critical divisor for each state.
 - (e) What is the Jefferson apportionment for this census?
 - (f) What is the largest whole number divisor that generates this Jefferson apportionment?
- (2) Suppose we have three states with population $p_1 = 13,000$, $p_2 = 25,000$, and $p_3 = 62,000$. A table of the first ten critical divisors for each state looks like this:

Name: _____

	State 1	State 2	State 3
1	13,000	25,000	62,000
2	6,500	12,500	31,000
3	4,333	8,333	20,667
4	3,250	6,250	15,500
5	2,600	5,000	12,400
6	2,167	4,167	10,333
7	1,857	3,571	8,857
8	1,625	3,125	7,750
9	1,444	2,778	6,889
10	1,300	2,500	6,200

- (a) What is the apportionment when $h = 8$? Name a divisor that will give this apportionment.
- (b) What is the apportionment when $h = 10$? Name a divisor that will give this apportionment.
- (c) How many seats do we need to apportion before state 1 gets a second seat?
- (3) Do *The Mathematics of Politics* problem 8.2
- (4) Do *The Mathematics of Politics* problem 8.6