Math 1007 Fall 2026
Mathematics and Politics
Homework 6 Due on Blackboard
Tuesday, October 13

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) Do *The Mathematics of Politics* problem 7.14.

(2) 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?

(3) 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:

	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?