

Quiz 5A, Math of Democracy

Fall 2018, Dr. Adam Graham-Squire

Name: Key

8 min
 \Rightarrow 30

1. The following country needs to apportion 43 seats to its House of Representatives.

State	Population	SQ	H
A	588	22.06	
B	142	5.32	
C	134	5.028	
D	64	2.40	
E	218	8.18	
		Total: 1146	

(a) Use Hamilton's method (round down, take largest fractional parts) to apportion the 43 seats. Explain/show your work.

(b) Use Webster's method (conventional rounding) to apportion the 43 seats. Explain/show your work.

(a) $1146/43 = 26.6512 = \text{stand. divisor.}$

Hamilton originally does $22 + 5 + 5 + 2 + 8 = 42$, round up

for D b/c it has largest fract. part \Rightarrow 22, 5, 5, 3, 8

(b) Webster with SQ is 22, 5, 5, 2, 8 \downarrow (all round down)

Need to ~~increase~~ reduce divisor from 26.65. Try

26.1, get

A = 22.53	\Rightarrow	23	✓ for Webster
B = 5.44		5	
C = 5.13		5	
D = 2.45		2	
E = 8.35		8	

2. Consider the 4 apportionment methods: Hamilton (largest fractional part), Jefferson (round down), Adams (round up), Webster (conventional rounding). This question is about whether the method favors certain kinds of states.

(a) Name a method that consistently favors *smaller* states, and explain why. It is fine to reference an example, but for full points you should explain why *in general*, that method tends to favor smaller states.

Adams favors smaller states b/c you round up.
This means that each state wins one seat right off the bat, and you have to modify the standard divisor up (since original sum will be too large). Dividing by a larger divisor will tend to hurt large states because they have more population to divide into.

(b) Name a method that consistently favors neither smaller or larger states, and explain why. It is fine to reference an example, but for full points you should explain why *in general*, the method favors no one.

Hamilton and Webster tend to favor neither. Hamilton, in particular, just looks at largest fractional parts, and a smaller state is just as likely to have a large fractional part as a large state does, so Hamilton treats them equal.

+10 for correct, remaining 1.5 for explanation

~~Adams~~