

Math 1015: Homework #2

Question 1. I'm voting with my friends about the best local dog salon. Our choices are "Snip Doggy Dog" (D), "Sham Pooch" (P), "Woof" (W), and "Ruff Cut" (R). (These are all real places.) People's votes are like this:

1	2	1	1	4
R	W	D	D	P
D	R	R	R	W
W	D	P	W	D
P	P	W	P	R

Please determine the results if we are using:

- a) Condorcet's method
- b) Borda Count

Question 2. Here are the votes for the 2022 special election in Alaska between Mary Peltola, Sarah Palin, and Nick Begich (rounded, in thousands):

48	34	27	24	21	16	11	5	4
Pel	Pal	B	Pel	Pal	B	B	Pel	Pal
B	B	Pal			Pel		Pal	Pel
Pal	Pel	Pel			Pal		B	B

Please show that Begich was the Condorcet winner of this election.

Question 3. In real life, the winner of the Peltola-Palin-Begich election was Peltola, even though Begich was the Condorcet winner. (Peltola is a democrat, Palin & Begich are republicans.)

- a) Pretend you are a Republican who is about to appear on a news talk show, and write a brief statement explaining why you believe this outcome was unfair to Begich. Since you're appearing on the news, you shouldn't use words like "Condorcet winner" or any jargon like that. Explain it so that anybody could understand, even somebody who doesn't know anything about the mathematics of voting. Be specific! Don't just say that lots of people liked Begich.

(You can probably explain this in just a couple of sentences. You can write more than that if you want, but you don't need to.)
- b) Was this outcome similarly unfair to Palin? Or does the basic argument fall apart in her case? Again, explain in a few sentences.

Question 4. Some RCV advocates say this when trying to make RCV sound good: “In a RCV election, if your first choice doesn’t win, then your vote will get counted for your second choice instead.” This is not actually true. Use the example of the Peltola-Palin-Begich election to explain specifically how this wasn’t true in that case. (You should be able to find some of those voters whose first choice didn’t win, but their vote never got counted for their second choice.)

Question 5. In June 2025 there was a democratic primary election for New York City Mayor using Ranked Choice Voting. There were many candidates on the ballot, but the top 3 candidates were Andrew Cuomo (C), Brad Lander (L), and Zohran Mamdani (M). The voters rankings for just these three candidates were as follows (in thousands):

375	282	85	83	82	47	35	31	29
M	C	L	M	C	C	L	L	M
L		M		L	M		C	C

Please find the Condorcet winner, or say that there isn’t one.