

# Essay 3

## Beyond Impossibility

MATH 100: THE MATHEMATICS OF DEMOCRACY

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### DESCRIPTION

In light of the Arrow and Gibbard-Satterthwaite “impossibility theorems”, the vagaries of voting power, and the subtle paradoxes of apportionment, direct democracy is clearly in serious trouble. Nevertheless, we must have societies, and so we must have voting systems if we are not to abandon democratic ideals altogether.

Select a specific, interesting real-world democratic system<sup>1</sup>, past or present. Write a long-form journalistic essay or column<sup>2</sup> in which you study this system in light of what you’ve learned in the course.

Your essay should:

- Explain what system or process is used by your democracy.
- Discuss the important mathematical properties of that kind of system and show which ones are and are not satisfied.
- Explain the relevant mathematical results (such as Arrow’s impossibility theorem) and discuss how they affect your democracy.
- Argue that the system used in your democracy is or is not ideal in light of what you now know about the subject. If you believe it *is* ideal, respond to the strongest criticisms you can devise. If you believe it *is not* ideal, propose a reform which would improve it, and provide strong arguments and evidence that this is in fact an improvement.

### REQUIREMENTS

Your paper must be double-spaced with a standard 12 pt font and 1 in margins.

This paper must be approximately 2000 words in length. Its format, tone, and content must be appropriate to its setting: as a journalistic essay, this piece will be published in general circulation and read by a lay audience. Do not assume that your reader has a technical background in the material you are using—*explain everything!* (If you are unsure whether you have succeeded, ask a friend who is not in the course to read your essay.)

Any outside material used in your essay must be cited properly according to a standard style format. You may choose which stylebook to follow; I have no preference among APA, MLA, Chicago, and other standard styles, so long as I can make sense of the format.

### DEADLINES

**25 November** Final paper due at midnight CST. To ensure that everything makes it in properly (given that I am unlikely to be in my office that evening), this paper *must* be submitted electronically.

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<sup>1</sup>This may be interpreted broadly. For example, the system used to select recipients of the Oscar is a “democratic system”, in that the members of the Academy use a voting procedure to execute their preferences.

<sup>2</sup>For stylistic inspiration, see e.g. the New York Times’ “Opinionator” column, Rolling Stone feature articles, or pieces by Matt Taibbi or Charlie Pierce.