

## 24.118: Paradox and Infinity, Spring 2024

### Response Set 1: Self-Reference

Please include your name and list all of your collaborators on the last page of your response set, preferably a separate page so that no one sees it till the end. *Failing to list collaborators constitutes a violation of academic integrity.*

How your answers will be graded:

- There is no quiz this week so all answers are to be submitted by PDF.
- Each response should be a maximum of 250 words.
- Responses will be evaluated by the clarity, concision, and the degree to which they reflect careful reading and comprehension of the text. Begin by working out your thoughts separately as you might with a problem set, writing up your response only once you have a good sense of what you want to say and how you want to say it.
- You are encouraged to read critically rather than accepting every word of a text as true. At the same time, it is important to be charitable to what the author intends. When something in the text is less than clear, it is important to do your best to get clarity about what the author intends to express, assuming the best interpretation consistent with the text before delivering any criticisms. For instance, saying that something in the text is not clear is not a good criticism even if it is true.
- You may consult published literature and the web, but you must credit all sources where failure to do so constitutes plagiarism and can have serious consequences. For advice about how and when to credit sources see <https://integrity.mit.edu/>. Note that merely citing a source does *not* count as a good justification.
- Reading old texts is hard! So don't worry if you struggle to understand every point. Instead, do your best to learn what the author is trying to express, using this as a chance to sharpen your close reading skills.

All submissions must be in PDF format. Type-written submissions may be strongly preferred by your TA; handwritten submissions are acceptable only if:

1. Your handwriting is easily legible (as judged by your TA);
2. You produce a clean version of the document (as opposed to the sheet of paper you used to work out the problems); and
3. Your manuscript has been scanned to high enough standards (as judged by your TA). Consider using, e.g. *Scannable* or *Adobe Scan*.

**Note:** All references this week will be to Russell's (1908) paper "Mathematical Logic as based on the Theory of Types."

1. On p. 225, Russell argues that there, "is no such thing as the class of all classes." Provide a reconstruction of this argument, carefully justifying each step. Do you find Russell's argument persuasive?
2. On p. 236, Russell claims that what is essential for legitimately speaking of "all of a collections" is not finitude but what he calls *logical homogeneity*, admitting that it is not always obvious whether a collection possesses this property given the, "concealed ambiguity in common logical terms such as *true* and *false*..." Explain what Russell means by 'logical homogeneity' and why he thinks 'true' and 'false' are ambiguous. Do you find this suggestion plausible? Say why or why not.
3. On p. 237, Russell presents one version of his *vicious circle principle* (VCP). Provide a reconstruction of VCP along with an example that fails to conform to VCP. Are there innocent (i.e., non-paradoxical) examples that are banned by VCP that are worth trying to save? What is the underlying reason one might take VCP to be true and do you find these reasons compelling?
4. On p. 238, Russell solves the liar paradox. Provide a reconstruction of his solution and comment on whether you find this solution compelling or not (say why). What are the downsides to adopting Russell's solution, and are these costs worth paying?