Paper #1. Due Weds Oct 12.

Instructions:
(a) Choose one of the following topics and respond to it in an essay of no less than 5 pages (not including title page and bibliography) and no more than 7 pages. Your essay should be typed, 10- or 12-point, double-spaced and spell-checked. Please submit an ecopy of your paper to the link in the Assignments folder in the NYUClasses website for the course.
(b) Your essay should conform to the Paper Guidelines on the unofficial course website:
    http://research.engineering.nyu.edu/~jbain/spacetime/paper_guidelines.pdf
(c) Your essay must include a bibliography that minimally includes the relevant course readings. Your essay must use this bibliography as a source to cite for all claims and quotes you attribute to authors. (Don't list the lecture slides and/or lecture notes in your bibliography.)
(d) Your essay will be graded solely on its content, and not on spelling or grammar. If you have trouble with spelling or grammar, Tandon's Writing Center is available to students and offers online help with proof-reading essays:
    https://nyupoly.mywconline.com

1. Aristotle ultimately responds to Zeno's Dichotomy argument by invoking two senses in which spatial and temporal intervals can be infinite. Explain in detail this response and why Aristotle ultimately rejects it. In what sense can the more contemporary response to Zeno based on the work of Cauchy be seen as an elaboration of Aristotle's response?

2. Describe in detail Zeno's Arrow Paradox. What concept of motion does Zeno presume, and on what concept of motion can a resolution of the paradox be constructed? Does the contemporary notion of "instantaneous velocity" play any role in the latter?

3. Should Aristotle's theory of motion be considered a quaint, outdated theory that is no longer relevant to our understanding of natural phenomena? Why or why not? (To address this question consider Carlo Rovelli's (2015) article "Aristotle's Physics: A Physicist's Look", available on the course website. Rovelli is a well-known theoretical physicist who claims "Virtually everything of Aristotle's theory is still valid"!)

4. Describe in detail Cantor's proof that there are more real numbers than there are natural numbers. Now explain how this result can be used to avoid Zeno's Paradox of Plurality.