

Mathematics 116

Convexity and Optimization with Applications

Assignment II	Due in class on Tuesday, February 22.
Announcements	Sections meet Thursdays at 7pm in SC 411 and Mondays at 8pm, also in SC 411. You are welcome to either or both. We are fortunate to have as course assistants Inna (zakharev@fas) whose office hours are Sundays at 8pm in the 4 th floor math lounge, and Jeff (hammerb@fas) whose office hours are Mondays at 7pm there.
Reading	Continue studying chapters 2 and 3 of Sundaram's FCOT, §1.2, his Appendices, and §12.4, too. Read chapter 2 of Luenberger's OVSM. For those interested in finding out more about rigorous argument, the book <i>How to Read and Do Proofs</i> by Daniel Solow is a classic.
Exercises	From FCOT§1.7: #5, #6, #27, #28, #45, #46; §3.4: #15; and §12.7: #1, #2, #8.
Writing	<p>In addition to handing these few paragraphs in with the other problems, you may also post your answers to the discussion section of the website (www.courses.fas.harvard.edu/~math116).</p> <ol style="list-style-type: none">1. Write a paragraph or so explaining continuity in your own words. Include examples and say why you think this idea is significant when considering optimization problems. What if you were only interested in maximizing instead of minimizing?2. Write a paragraph or so explaining compactness in your own words. Include examples and say why you think this idea is significant when considering optimization problems.
Discussion	<p>Please come to sections prepared to discuss the following questions. If you want to post your answers on the web site, please do so by Sunday.</p> <ol style="list-style-type: none">1. Describe the p-norms as defined in FCOT §C.3 or OVSM §2.10. What do the unit balls look like for various values of p? What happens if $p < 1$? If p tends to infinity? Think of other unusual NLS examples.2. FCOT §1.7: #34. And what if you preferred talking about open sets?
Words	Vocabulary to know includes: continuous function, vector space, norm, metric space, Cauchy sequence, completeness, Banach and Hilbert spaces.