

Math Camp Summer 2014

Description of Preview Materials

July 18

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Description: The goal of this part of the math camp is for you to get acquainted with the basic topics of linear algebra and calculus, so that we can spend sessions covering more in-depth topics that are directly related to the formal and quantitative courses. Thus, we will assume your familiarity with the materials covered in this part when we meet at Princeton.

The preview materials consist of video lectures, assigned readings, and exercises. Two topics, one in linear algebra and the other in calculus, will be assigned for every week. Therefore, there are two sets of materials for each week. The schedule can be found below.

Exercises are due on Thursdays. We recommend that you start reading assigned chapters of the textbooks and watching video lectures on Friday, and then move on to exercises by Tuesday. We also strongly encourage you to post questions on Piazza discussion board. We will do our best to answer your questions as soon as possible.

Textbooks and Video Lectures:

- Linear Algebra
Gilbert Strang (**S**), *Introduction to Linear Algebra*, Wellesley-Cambridge Press.
<http://ocw.mit.edu/courses/mathematics/18-06-linear-algebra-spring-2010/video-lectures/>
- Calculus
Adrian Banner (**B**), *The Calculus Lifesaver*, Princeton University Press.
https://www.youtube.com/playlist?list=PLGqzsq0erqU6cwuyDoAh1GYEFF2hB_YFc
<https://itunes.apple.com/us/podcast/calculus-lifesaver-lecture/id266853222?mt=2>

Schedule

Linear Algebra

Due	Topic	Video	Reading
July 24	Linear Equations	1-5	1.1-3, 2.1-7
July 31	Vector Spaces and Subspaces	6-10	3.1-6
Aug 7	Orthogonality/Determinants	14-18	4.1-4, 5.1
Aug 14	Determinants/Eigenvalues and Eigenvectors	19, 21-22, 25	5.2, 6.1-2, 6.4-5
Aug 21	SVD/Linear Transformations	29, 30-31, 33	6.7, 7.1-3

Calculus

Due	Topic	Video	Reading
July 24	Functions/Limits	1-2	3-4
July 31	Continuity/Derivatives	3-4	5-9
Aug 7	Implicit Differentiation/Mean Value Theorem/ Critical Points	5,8	8,11
Aug 14	Optimization/ L'Hopital's rule	10	13-14
Aug 21	Integration	11-13	16-19

Note: The number of the video lectures correspond to the ones next to their name in the lecture available for free in iTunes (webpage posted above).