

Review — I

Here are some suggestions for review in connection with the midterm examination to be held on Friday, April 29, 2011. The term “nice space” refers to one which is Hausdorff and locally arcwise connected.

Here are the main topics that may/will be covered:

- (1) Applications of the lifting criterion which determines which maps from a nice space A to another nice space Y can be lifted to the covering space X , where $p : X \rightarrow Y$ is the covering space projection.
- (2) The existence and classification results for nice connected covering spaces of a nice space with suitable local simple connectivity properties.
- (3) Free actions of finite groups, applications to covering spaces, and important examples where the total space of the covering space projection is a familiar object like a sphere, torus or Euclidean space. Applications to realizing certain groups as fundamental groups of nice spaces.
- (4) Free groups, free products and pushouts, including their Universal Mapping Properties.
- (5) Statement of the Seifert-van Kampen Theorem and examples of applying it to important special cases.
- (6) Graphs, their fundamental groups, and their finite covering spaces.

Relevant sections in Bredon:

III.5–III.9 for the topics covered, but these build upon concepts from III.1–III.4 so a brief review of the latter may be advisable.

Relevant files in the course directory:

exercises00.pdf
exercises00a.pdf
exercises01.pdf
exercises02.pdf
freeactions.pdf
freegroups.pdf
graphs.pdf
graphs2.pdf
graphs3.pdf
hwassignment1.pdf
math205Ctopic00.pdf
math205Ctopic01.pdf
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