UPDATED GENERAL INFORMATION — DECEMBER 5, 2014

The third in-class examination

The third in-class examination, which will take place on **Friday, December 12**, will be comprehensive, covering the sections

III.1 , III.4–5 , V.1 , VI.1–4
VII.1 , VII.3–4 , VIII.1–4

in `gentop-notes.pdf` and `fundgp-notes.pdf`; the material from Units I and II forms a foundation for the listed sections, but there will not be any problems dealing specifically with the first two units. In addition, the addenda files

`secVII4-addendum.pdf` `secVIII2-addendum.pdf` `secVIII3-addendum.pdf`

are included in the material that is subject to testing.

It is particularly worth noting that **nothing from Unit IX will appear on the exam** because it generally takes more than two weeks to successfully assimilate the material in that unit. However, the material in Section VIII.5 and Unit IX will almost certainly be covered on qualifying examinations, so **(most) students will have to learn this material eventually**. Similar considerations hold for sections which received some coverage in the course but were not listed above (for example, portions of III.3 and VI.5, and all of V.2).

There will be five problems. Four will cover material from the previous two examinations, and one will cover more recent material. These will involve giving proofs for results or exercises from class and interpreting the conclusions in special cases, with more of the former. Here are a few specific items to consider.

Results from `gentop-notes.pdf`. III.1.1, III.1.6, III.4.13, III.5.3–6, VI.3.2, VI.3.4, VI.4.2

Results from `fundgp-notes.pdf`. VII.1.3, VII.3.3, VIII.3.1, VIII.3.5–7 (for VII.3.3, you should also understand how to draw the added conclusion that the smaller set is a strong deformation retract of the other)

Exercises from Munkres. 23.2-3, 26.3, 27.2, 28.2 for products with finitely many factors, 54.2, 54.4, 54.6 (a solution to 28.2 for finite products appears in the recently added file `math205Asolutions05a.pdf`)

Additional Exercises. VI.3.3, VII.2.1

In addition to the preceding, here are some questions worth studying:

1. Suppose that X and Y are compact Hausdorff spaces and A is a closed subspace of $X \times Y$. Prove that A is normal.

2. If X is a topological space and A is a closed subset of X, let X/A denote the quotient of X by the equivalence relation whose equivalence classes are all point point sets $\{x\}$ such that $x \notin A$ plus the set A, and let $p : X \to X/A$ denote the quotient space projection. Prove that p is a closed mapping but not necessarily an open mapping. Given a set M containing the equivalence class $[A]$ in X/A, translate the statement, "M is an open neighborhood of $[A]$," into a statement about its inverse image $p^{-1}[M]$.