

Learning goals for 2009 REU, “Groups, graphs, and geometry”

By the conclusion of this coming summer’s program, the participating students should...

1. demonstrate knowledge of the fundamental concepts of graph theory, group theory, metric geometry, and dynamical systems and understand cutting-edge open problems in these fields,
2. be able to make effective use of research databases, including MathSciNet and arXiv,
3. feel comfortable in generating new questions and topics for research, either by modifying and generalizing existing statements, or by branching off into uncharted mathematical territory,
4. identify the qualities that make for a friendly and effective research community,
5. be able to demonstrate high-level use of a computer algebra system such as *Mathematica*,
6. show facility in working within the \LaTeX typesetting environment,
7. demonstrate familiarity with the structure of a mathematical research paper, and be able to construct such a paper,
8. confidently communicate mathematics orally, to an audience of peers or to an audience consisting of research professionals,
9. understand the dynamics of, and feel comfortable working in, a collegial research group,
10. show (through questioning, for example) a healthy skepticism and authority to challenge as yet unproven results,
11. be ready to present their findings to an appropriate audience at a regional or national conference, and
12. demonstrate familiarity with the structure of the mathematical community at large, and understand their own place in it.