

Mathematics 2084H – Recreational mathematics

TRENT UNIVERSITY, Winter 2009

Project

Due Friday, 3 April, 2009.

Topics

Most projects are likely to be expository, in which you describe something related to recreational mathematics. Most such topics boil down to discussing some bit of mathematics that someone did for fun or to describing some bit of recreation (toy, puzzle, game, trick . . .) with mathematical content, and explaining that content. If you want to take the first tack and are looking for a topic, you might start by looking through the textbook or follow up some of the links given on the course web page. Online searches would probably work well for the second tack, though a visit to a toy or game store could go a long way too. For either tack, one could do very well by looking through Martin Gardner's many magazine articles and books on recreational mathematics, especially the collections of his column *Mathematical Recreations*, which ran in *Scientific American* for twenty-five years.

One possible alternative to a purely expository project would be to do one that describes the history of a topic related to recreational mathematics. Many topics in recreational mathematics have very long histories, such as magic squares and figurate numbers, or pretty colourful ones, such as the 15 puzzle, or have connections to significant areas or results in the mathematics, such as colouring and tiling problems. Another possible alternative is to look at uses of recreational mathematics == other than to just have fun – such as those in education and research in psychology. For two examples, Montessori techniques involve using play with mathematical toys and games to teach elementary mathematics and puzzles with mathematical content are used as part of many IQ tests.

Still another possibility is to do something at least partly original, such as creating a puzzle or game with mathematical content, and then explaining it.

Form

Note that I am willing to consider forms other than expository papers for the projects and that you may do group projects. Be warned, though, that other forms are generally harder to carry off well and that I will expect more from group than individual projects. *Whatever sort of project you do, please clear your choice of topic and intended form with me*, preferably before you put in a lot of work on the project. The minimum length for an individual paper ought to be about 2000 words; if you use another form, you should try to have an equivalent amount of actual content.

Alternative forms were tried a few times with some degree of success in the reading courses on recreational mathematics that I taught before this course was offered. The most successful was the creation of educational materials involving recreational mathematics, along with instructions for their use and a report of how it went when the materials were actually used in class.

Format

Whatever form you choose, what you submit should have decent grammar, spelling, and style. I am not fussy about formatting and bookkeeping, such as how you handle footnotes and/or endnotes in a paper, so long as you're consistent in how you do things and what you've got is readable.

Help

Academic Skills offers help with essays and writing in general and you may find the staff at the Library useful with problems involving research for your project. Keep in mind that you may consult and help each other on your projects even if you're not doing one together, and that you may consult and get help any other (willing!) individuals and sources too. (Be sure to acknowledge any help that you actually used.) Finally, I would be happy to suggest topics, offer advice about research, and so on. I am also willing to look at and criticize outlines, fragments, and drafts of your project if you give me enough time to read and think about them.