## MA330 Sathaye

## Thinking about projects

It is time to start thinking about the projects that you wish to do for the 2/3 rd of your grade. As you know, the first project is due after midterm and the second at the final time. It may make sense to make them related to each other. Recall that you are expected to give a short oral presentation, so the final project needs to be in an almost finished state at least two weeks prior to the formal submission date for the written part.

I am making some rather general suggestions for topics below. Any creative suggestions from you are always welcome.

I suggest you try to settle on some idea within next couple of weeks and talk to me as early as possible.

- 1. Historical data Try to collect biographical information on a few mathematicians from India. These could be chosen by a time frame or by the kind of mathematical work. You could also settle on some mathematical topic and collect details of available resources. You can augment this by locating matching/contrasting data from other parts of the world Egyptian, Babylonian, Greek, Chinese etc. Make every attempt to see that you make a distinction between evident facts and the opinions of the historians you use.
- 2. Mathematical details Consider picking on some mathematical topic from Indian mathematics and try to give details of its development. For example, geometric constructions, approximations, zero, number systems, writing systems, topics in algebra or geometry, combinatorics, series etc.
- 3. Mathematical arguments Look up or provide modern justifications (or refutations) for the assertions in old mathematical literature. Some of these proofs can involve rather serious mathematics.
- 4. **Computer work** If you have the expertise, consider implementing some of the old calculation techniques using computers. Explore if any can be extended to a more general situation. You have access to Maple to do this.
- 5. **Independent research** Pick up appropriate journal articles related to Indian mathematics and report on them by giving a summary augmented by your personal comments, if any. I have several books and references which you may consult, if the net search does not give much help. Do not trust articles posted only on the network, because they can be highly biased. You may, however, consult and analyze them for validity.

One possible project, if you are a net-expert, is to collect and classify links related to Indian mathematics. Some of the sites listed by me are a good start in this direction, but it would be useful to have a well classified and commented collection. Such a project may be taken up by a small group of 2/3 individuals, if they all actively contribute to it. Some of my history books may be used to create the headers and fill them in with links.

6. Encoding projects I have several manuscripts in printed form with some having the text in a transliterated roman script. It would be desirable to have the text encoded in a computer file, so it can be analyzed more efficiently. If you have the time and the inclination, the work is easy. You are typing ordinary 7 bit ascii code which is easy to learn. I and several volunteers have done hundreds of pages of Sanskrit documents' encoding in the past, but not many mathematical documents are encoded so far. Whatever you do will become public service for years to come.