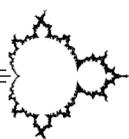$$ Team Play Tips

The Mandelbrot Team Play is a bit different in format than most high school math contests, so we have assembled a tips sheet which lists useful strategies for working together effectively. These observations are based on our own experiences working with teams as well as grading numerous team tests. We hope that these suggestions will make competing in The Mandelbrot Team Play more exciting and worthwhile.

- **Review topics ahead of time.** Limited space on Team Play tests necessitates brief exposition of theorems, facts, and definitions. Studying the topics and working on the practice problems ahead of time ensures that your team will save time, learn more, and make significantly more progress on the contest. For the truly dedicated, there are compilations of past team tests available; click on the `Resources` link at the web site.

- **Many hands make light work.** There should be too little time for only one or two members of the team to solve and write up solutions to all the problems. (This is done on purpose.) It pays to spend a few minutes at the outset to read over the whole test together, understand all the questions and terms, and then delegate responsibilities. Keep in mind that the first two parts are invariably easier than the others. In addition, there is absolutely no penalty for using the result of an earlier part to solve a problem. (But avoid using later parts to solve a problem — this leads to circular reasoning!) Thus if part ii asks for a proof that $AB = AC$, then you may use this fact as a given while working on part iii.

- **Good writing takes practice.** This may be your first experience in mathematical writing. It's harder than you might think to explain your own approach in a clear, concise, and convincing manner. Try to have the outline of the whole proof in your head before you begin writing. It helps to lead off with a summary statement indicating your plan of attack, such as, "We will prove that $AB = AC$ by showing that triangles ABR and ACS are congruent. To begin, $\angle ARB \cong \angle ASC$ because ..." Remember to leave enough time to write up your solution, as this inevitably takes longer than you think. Also, if you are not able to complete a proof, at least write down your ideas as to how you think your argument could be finished if you had more time. (However, please do not submit scratch paper.) Finally, take a few minutes to read over the official solutions after the test. These are good examples of mathematical writing.

- **DON'T PANIC.** You, the reader, are a very intelligent person. Some of the topics on the Team Play tests may be unfamiliar, but the questions are not necessarily hard, especially the first two parts. Reviewing topics ahead of time, understanding the setup, and then using your head will take you a long way towards a solution.

Enjoy this year's contest, and good luck on The Mandelbrot Team Play!