



# Administration

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## THE MANDELBROT COMPETITION

**Overview** Each of the five rounds consists of seven questions drawn from a variety of non-calculus topics in high school mathematics. The questions are listed more or less in order of increasing difficulty and are worth a total of fourteen points. Students write their answers in the space provided next to each question. Contestants are allowed 40 minutes to work on the problems, during which time they may not collaborate or use any outside aids such as calculators, texts, dictionaries, graph paper, ruler or compass.

**Two levels** The Mandelbrot Competition is offered at both a regional and national level, the latter being significantly more difficult than the former. Coordinators that have enrolled their schools in both levels will need to decide at the outset of the year which students will participate at which levels. In general, the national level is intended for students who expect to qualify for the AIME; it is designed to challenge even the strongest contestants. Keep in mind that once the first round has been completed, students may move down from the national to regional level tests (keeping their scores), but not vice-versa.

**Preparation** On Thursday preceding each round a contest download link will become available to all coordinators. Those schools opting for electronic delivery will obtain contest materials in this manner, but the download link is available to all schools; for instance, if a mailed contest original is misplaced. To access this link, log in to your Mandelbrot account as usual, click on the “Contest Materials” menu tab at the top of the page, then select the desired document to download. If there is a conflict with the regularly scheduled week we ask coordinators to give the contest one week early, retaining all testing materials until the Sunday following the official week. Please contact Greater Testing Concepts to obtain contest files early.

*We strongly encourage all coordinators using electronic delivery to download and print out each contest original at least a day in advance.* The morning of the competition (or no sooner than a day or two earlier) the school coordinator should make a sufficient

number of copies of the contest for all participants. Any number of students may take part, as long as all students take the contest on the same day (generally at the same time) under the supervision of a proctor.

**Contest procedure** Distribute plain white scrap paper and copies of the contest, face down. On your signal, have students fill in their names and begin work. At the conclusion of the 40 minute period announce “Pencils down,” collect the papers and scrap work, and retain them until the weekend following the contest week. Students should also refrain from discussing the problems until that Sunday. On Thursday during the contest week the download link for the solutions will appear, at which point the coordinator may score the papers and update the score sheet(s) with students’ scores for that round. Note that answer keys are not provided in advance.

Schools with many students participating should make sufficient copies of the score sheet prior to the first round. In addition, schools competing at both levels should track regional and national contestants on different score sheets. To report scores, just visit [www.mandelbrot.org](http://www.mandelbrot.org) and select the **Enter scores** link on the left sidebar. This should be done by the following Tuesday, but entering scores later is not a problem; the standings automatically update to display the most current information. During the week following the official contest week the coordinator may return papers, distribute solutions, and discuss the problems with students.

**Scoring** The questions are worth either 1, 2, or 3 points, depending on their difficulty. Responses which are clearly equivalent to the answer in the key, such as 3.25 for  $13/4$ , or  $1/\sqrt{2}$  for  $\sqrt{2}/2$ , should be accepted. Otherwise no credit is to be awarded. Any appeals, such as an alternate interpretation of a problem or a disagreement with the solution in the key, should be made in writing and sent via US mail or email to Greater Testing Concepts. We will make judgments and corrections as quickly as possible and notify all coaches by email of any appeals that are granted. We welcome alternate solutions or other feedback on the tests; we publish these notes along with various other announcements in our newsletter.