

# Math Field Day Contestant Instructions

No calculators or phones may be used in any contest. No notes or other materials may be used in any contest except Chalk Talks. Bring pencils for your own use.

## **Mad Hatter**

There are two Mad Hatters, A and B. Mad Hatter B is only for sophomores or freshmen, and it does not include logarithms or trigonometry. Mad Hatter A is unrestricted. The room numbers for the Mad Hatters are listed on the inside front cover of the program you receive at Registration. No calculators, phones, notes, or books are allowed.

Problems are flashed on a screen. After working a problem, write the answer on the answer sheet and raise your hand. When roughly half the contestants have raised their hands or, in any case, when one minute has elapsed, the next problem is shown. You must simplify your answers whenever possible.

The contest starts with four warm-ups numbered (i) to (iv). These are followed by 40 problems, which are graded entirely right or wrong with one point for each answer.

Be sure to draw a line in the answer space for any question you do not answer. This will help prevent you from writing answers in the wrong spaces. No credit is given for shifted answers. Give the answer sheet to the proctor at the end of the period.

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## **Leapfrog**

The room number for this event is listed on the inside front cover of the program you receive at Registration. The competition lasts 55 minutes. No calculators, phones, notes, or books are allowed. You and your teammate are given a set of 8 problems. You are encouraged to distribute the work between yourselves, work together very quietly, and check each other's work. Problems are graded entirely right or wrong. All answers must be simplified. You receive 2 points for each right answer and 0 for each incorrect or blank answer. There is no penalty for incorrect answers. Give the answer sheet to the proctor at the end of the period.

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## **Chalk Talk**

1. You should be prepared to give a five-minute talk on one of the two topics announced for the year.
2. You will have a warm-up room ten minutes before your talk. At the time prescribed in your schedule you should go to the Chalk Talk room. Your talk will be judged on:

a) content, b) presentation, c) effective use of the chalkboard, and d) reply to questions.

Visual aids are not encouraged, although they may be appropriate for some topics. You may refer to notes, but your talk should not be read from them. Significant use of the chalkboard must be made.

3. Talks will be timed by a Field Day volunteer, with penalties assessed for exceeding the five-minute limit. The volunteer will use the following signals:

Two minutes to go: Hold up two fingers.

One minute to go: Hold up one finger.

Time is up: "Cut" across throat with one hand.

One minute overtime: Stand up. Speaker may finish the sentence and must then stop.

4. At the end of your talk the judge will ask you questions, based on what you have said. These should be answered briefly in 45 seconds or less.

5. Only the contestant speaking, the judge, and the Field Day volunteer are permitted in the room.

6. Contestants are divided into several rooms and one judge will be assigned to each room. The judge selects one winner for the room, who earns the maximum score of 10 points. Scores for other contestants in the room are scaled accordingly.

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## **Team Essay**

1. Your team has 40 minutes to answer a series of questions asking you to explore a single topic.

2. Your team must turn in at most one answer to each question. The answers must be numbered and written in order, but you may skip problems if you choose. Number the pages you turn in.

3. Your answers will be judged on the clarity and correctness of the writing style as well as on mathematical correctness.

4. Organize your team and time in any way you decide is best. Only team members may be in the room during the essay. You may not bring any notes, books, phones or calculators into the room.

5. A proctor will be just outside the room and will warn you 10 minutes before your time is up. Give your answer sheets to the proctor at the end of the period to place in the inner envelope. Clean up all scratch paper.

## Huddle

Your team has 10 minutes to solve 4 problems. You may organize your team effort any way you like. Nobody but team members may be in the classroom during the Huddle. Write your team's answers on the answer sheet provided. All answers must be simplified. A proctor will get you started and will give you a 2-minute warning. Give only the answer sheet to the proctor at the end of the 10 minutes. Clean up all scratch paper. No calculators, phones, notes, or books are allowed.

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## Swiss Game

A list of sixteen x-values is written on the board. For the first four, corresponding y-values are given according to a simple but secret rule that involves at most simple mental arithmetic. You must try to discover the rule and determine the rest of the y-values.

The two teams sit interleaved in a horseshoe arrangement facing the board. You study the board for one minute, trying to discover the rule. You may not use pencil and paper or other materials, and you may not communicate with your teammates.

Each round of the game concerns the y-values in the next two positions: round 1 concerns position's 5 and 6, round 2 concerns positions 7 and 8, and so on. All rounds proceed in the same direction around the horseshoe as students try in turn to guess the next y-value. Each student has at most six seconds to guess or say "pass." If the guess is incorrect, the scorer says "no" and asks the next student to guess the same y-value. If the guess is correct, the scorer says "yes," the correct value is written on the board, and the next student in line tries to guess the next y-value. Each team receives two points for a correct guess of a y-value in positions 5 through 8 and one point in positions 9 through 16. The round ends when two y-values are guessed correctly or when every student has had a turn that round, whichever comes first. Each round should last at most a minute. At the end of each round, any of the two y-values that have not been guessed are written on the board. No student has more than one turn per round.

There is a thirty-second break between rounds to study the board. Each round begins at the position of the horseshoe where the previous round ended, so that rotation around the horseshoe is unaffected by the end of the round. The game ends when the correct y-values in all sixteen places are written on the board or when ten minutes have elapsed, whichever comes first.

Four games are played. The first two begin at the same end of the horseshoe and proceed in the same direction, and the last two begin at the other end of the horseshoe

and proceed in the opposite direction. Team scores in the event are proportional to the total number of points that team members earn.

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## Relays

1. The contest consists of four relays. Team members sit one behind the other. Only a freshman or sophomore can sit in the second position. Teams may change seating arrangements between relays as long as the second person in line is always a freshman or sophomore. Teams with fewer than five members can participate by consulting the person in charge of the relay room.
2. Each chair will have scratch paper and 2 x 2 answer slips. In relays one through three, the answer slips are plain paper for seats 1 - 4 and printed for seat 5. In relay four, the answer slips are plain paper for seats 1, 2, 4 and 5 and printed for seat 3.
3. The proctors will distribute the five problems face down, one to each member. When the signal is given, all contestants may begin work. It is good for contestants to work on their problems even while waiting to receive answers. No calculators, notes, or books are allowed.
4. In relays one through three, only the first problem may be completely solved as given; to solve the others you need a number which is the answer to the problem of the team member in front of you. When you have solved your problem, write the answer, and only the answer on a 2 x 2 slip provided and pass it to the person behind you. The fifth member will write the final answer, the school name and the time interval on the printed form and hand it to the proctor.
5. In relay four, the first and fifth problems can be completely solved as given. The first member passes an answer to the second member, who in turn gives an answer to the third member. The fifth member passes an answer to the fourth member, who in turn gives an answer to the third member. The third problem requires the two inputs for its solution. The third member will write the final answer, the school name and the time interval on the printed form and hand it in to the proctor.
6. Team members may communicate in the direction answers are passed only by writing answers on blank slips. A team member may communicate in the other direction only by tapping the shoulder or desk of a person who handed him/her an answer in order to indicate that there is a problem with the answer received.
7. Each relay has three time periods ending after 2, 3, and 4 minutes. Warnings are given 10 seconds before the end of each period. The final person on a team may hand the proctor only one answer per time period and should wait until the final 10 seconds of the period to do so. Other team members may pass answers along at any time.

8. Only the last answer that a team hands in during a relay is graded. Points are given for correct answers based on the time interval in which they were handed in. All answers must be simplified, and any fractions must be written in lowest terms.