

The International Tournament of Young Mathematicians

REGULATIONS*

1. The language

The working language is English.

2. The teams

- a. One team represents any invited country. However, the OC reserves the right to accept more than one team from the same country.
- b. The team is composed of 5 high school students.
- c. The team is accompanied by one or two team leader(s).

The team leaders have to register their teams by sending an email to organizers.itym@gmail.com until **May 1, 2009**. An official invitation will be transmitted shortly after the registration.

3. The problems

The list of 10 problems is selected by the OC not later than in April.

The problems for the ITYM are estimated as difficult, containing parts with no known solution. The participating students are supposed to solve them by themselves, working with other members of their teams and supervised by their team leaders and teachers. All paper and electronic sources (books, articles, etc.) directly involved in proofs should be mentioned in the written materials.

No public collective help (such as forums) is officially allowed and any cheating team may be disqualified from the tournament by the OC.

4. The written materials

The teams should type their solutions and advances and send the written materials to organizers.itym@gmail.com. The deadline is **Thursday, June 25, 2009, before 6pm** (GMT).

Files with extensions DOC, DOCX, PDF and PS are accepted (a separate file per problem).

These and only these materials will be discussed during the tournament and no text editing will be permitted.

5. The Jury

The Jury for the Rounds and the Final is nominated by the OC. The Jury consists of at least five members and includes team leaders. The team leaders cannot be members of the Jury in the Group where their teams participate.

* June 17, 2009

6. The structure of the ITYM

The ITYM consists of two Rounds and the Final. In each Round, the teams are divided in Groups of 3 or 4. Within a Group, each team plays the three (four) roles – Reporter, Opponent, Reviewer (and Observer) – according to the tables:

Group of 3

	1st stage	2nd stage	3rd stage
Team 1	Rep	Rev	Opp
Team 2	Opp	Rep	Rev
Team 3	Rev	Opp	Rep

Group of 4

	1st stage	2nd stage	3rd stage	4th stage
Team 1	Rep	Obs	Rev	Opp
Team 2	Opp	Rep	Obs	Rev
Team 3	Rev	Opp	Rep	Obs
Team 4	Obs	Rev	Opp	Rep

7. The stage time limits

Pause. Preparation of the Reporter.....	10 min
Presentation of the Jury (1 st stage).	
The Jury shows the marks for the previous stage	5 min
<i>Presentation of the report</i>	10 min
Questions of the Opponent to the Reporter and answers of the Reporter.....	3 min
<i>Performance of the Opponent</i>	5 min
Reply of the Reporter.....	2 min
Questions of the Reviewer to the Reporter and to the Opponent and answers to the questions.....	3 min
<i>Performance of the Reviewer</i>	4 min
Non-obligatory actions:	
Concluding remarks of the Reporter.....	2 min
Additional remarks of the Opponent.....	2 min
Additional remarks of the Reviewer	2 min
Questions and remarks of the Observer	3 min
Questions and remarks of the Jury.....	5 min

8. The roles

The Reporter presents the main results and ideas obtained while solving the problem. A blackboard, a laptop, a projector and an episcope are available so that the Reporter may use PowerPoint and/or printed films.

The Opponent analyses the Reporter's solution and presentation, pointing to inaccuracy and errors in the report, as well as to advantages of Reporter's proofs. For the purpose of revealing

possible shortcomings, the Opponent draws the Reporter in a discussion of the presented results. However, the Opponent should not turn the discussion into an explanation of his/her own solution.

The Reviewer estimates the presentations of the Reporter and the Opponent by studying positive and negative aspects. One of the main intentions of the Reviewer is to detect whether the Opponent said anything wrong or overlooked Reporter's faults.

The Observer makes useful remarks but does not participate actively in the discussion.

Only one team member may take the floor during each stage, other members of the team are allowed to make brief remarks.

Before each Round and the Final, the Opponent, the Reviewer and the Observer prepare **written reviews** of the Reporter's materials (see section 4) indicating the mistakes they found (one-three pages). The reviews are graded by the Jury (see section 10).

9. The draws

The composition of the Groups for the first Round is determined by a draw.

In order to decide which problem each Reporter presents in a Round (or in the Final) a draw is held the day before the Round (or the Final). The captains of the teams from the same Group draw alternately cards with problems' numbers. A team may reject FOUR different problems in total without penalty (the problems presented by the team earlier don't count). For any subsequent rejection the coefficient k for the report (see section 10) is decreased by **0.5**. A team cannot choose a problem already presented by the team earlier during the tournament.

Within two hours after the draws, the corresponding written materials (see section 4) are distributed to the teams and to the Jury.

10. The grading

After each stage the Jury grades the teams, taking into account the written review (x) and the performance together with the participation in the discussion (y). Each Jury member shows an integer mark y from 0 to 10 for the Reporter and integer marks x and y for the Opponent, the Reviewer and the Observer, according to the following table:

	Written review x	Performance and discussion y	Jury's marks	Coefficient k	Resulting points
Reporter	0	$0 \leq y \leq 10$	y	3 or less	$x + ky$
Opponent	$0 \leq x \leq 4$	$0 \leq y \leq 6$	x and y	2	$x + ky$
Reviewer	$0 \leq x \leq 4$	$0 \leq y \leq 6$	x and y	1	$x + ky$
Observer	$0 \leq x \leq 4$	$-2 \leq y \leq 4$	x and y	1	$x + ky$

To calculate the resulting points of a team in the Stage, all marks of the Jury members for the team are summed, multiplying the marks y by the coefficient k . An exception: If there are at least six members in the Jury, then the highest and the lowest marks are not counted.

11. The rating

The rating R_n of a team in the Round $n = 1, 2$ is determined by the formula:

$$R_n = S / TS,$$

where S is the sum of the resulting points of the team in the Round and TS is the arithmetic mean of the resulting points of all teams in its Group.

The rating R of a team before the Final is calculated by the formula:

$$R = R_1 + R_2,$$

where R_1 and R_2 are the ratings of the team in the first and the second Rounds respectively.

12. The Final

The four teams with the highest ratings R participate in the Final. An exception: if the team winning the both Rounds and having the best rating R among all such teams doesn't reach the Final by the rating, then it takes part in the Final as fourth team.

The final team rating FR is defined to be the following sum:

$$FR = R + 3 \cdot R_F,$$

where R_F is the rating of the team in the final, it is calculated by analogy with the round ratings.