The International Tournament of Young Mathematicians
REGULATIONS[*]

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1. The language
The working language is English.

2. The teams
    a. Each team represents one country. However, the Organizing Committee (OC) reserves the right to accept more than one team from the same country.
    b. The team is composed of 4, 5 or 6 high school students and headed by a captain.
    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 **April 27, 2010**. An official invitation will be transmitted shortly after the registration.

3. The problems
The list of 9-12 problems is selected by the OC and published on the website http://www.itym.org/ in the beginning of **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.

Conversations with individual mathematicians are allowed. However, public collective help (such as internet forums) is not allowed and any cheating team may be disqualified from the tournament by the OC.

4. The written materials
The teams should type their solutions, even partial, and send the written materials to organizers.itym@gmail.com. The deadline is **Monday, June 21, 2010, before 11pm GMT**.

Files with extensions PDF are accepted, a separate file per problem, named in the following manner: "Country-ITYM2010-ProblemN.pdf". There is a **30 pages** limit per problem (**A4, 11pt**).

The first page of each file should contain the name of the team, the number and the name of the problem, and an abstract (a brief summary of results and methods, about ⅔ of the page).

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[*] June 8, 2010

The model for the first page:

Problem 4: A Baby Chess

Team: *France 2*

Abstract
In this paper we classify the winning strategies for the first player in the case…

These and only these written materials will be discussed during the tournament and no text editing will be permitted. Moreover, during his/her performance the Reporter (see section 8) is only allowed to present:

- parts of the written materials with no modification, e.g., exact statements with their original numberings, figures and diagrams,
- sketches of solutions and proofs, and ideas used in the written materials.

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.

6. The structure of the ITYM

The ITYM consists of two Rounds and the Final. In each Round, the teams are divided into Groups of 3 or 4 (see also section 10). 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 (1st stage).
The Jury shows the marks for the previous stage .... 5 min

Presentation of the report .... 10 min

Questions of the Opponent to the Reporter
and answers of the Reporter.. 4 min

Performance of the Opponent.. 4 min

Reply of the Reporter... 2 min

Questions of the Reviewer to the Reporter and to the Opponent
and answers to the questions.. 4 min

Performance of the Reviewer .... 3 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 ideas and results obtained while solving the problem. A blackboard, a laptop, a projector and an episcope are available so that the Reporter may use slides and/or printed films. The presentation should be based on the written materials (see section 4).

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 into 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 if the chairman gives permission to the captain of the team.

9. The written reviews

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-two

pages). In addition to a critical evaluation, a review's author may assign the work a merit rating by enligntening both positive and negative points.

The written reviews are graded by the Jury (see section 11).

10. 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/Final, a draw is held at least a day before the Round/Final. The captains of the teams from the same Group draw alternately cards with problems' numbers. A team cannot present the same problem twice in the tournament.

During each draw, a team may reject **four** different problems in total without penalty (the problems presented by the team earlier in the tournament don't count, as well as the problems rejected by the team earlier in the draw). For any subsequent rejection, the coefficient k for the report (see section 11) is decreased by **0.5**.

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

The first draw will be organized online on **Tuesday, June 22, 2010, at 3pm GMT**. A public chat in Skype will be open, so that everybody will be able to watch the draw by following a link given on the website http://www.itym.org/. Only the captains of the teams will have the permission to post messages.

> **Step 1** (Group and Order). An organizer places in a row T cards numbered from 1 to T, where T is the number of teams. Each captain picks a unique integer i from 1 to T and receives the integer written on the i-th card, which will be called the *ordinal number* of his/her team.
> The teams are divided into Groups according to their ordinal numbers: 1-4 for the first Group, 5-8 for the second Group, etc.

> **Step 2** (Problem's Number). An organizer places in a row P cards with numbers from 1 to P, where P is the number of problems. A captain picks an integer n from 1 to P. The organizer sujests the Problem numbered by the integer written on the n-th card. If the captain accepts it then the n-th card is taken away, else the n-th card is turned back over and all cards are shuffled. The Step 2 is repeated for the next captain within the Group.

The second draw is organized after the first Round. The Steps 1 and 2 are applied. The teams are divided into Groups according to the following rules:

First Round	Group 1	Group 2		Second Round Group 1	Group 2
1st place	A1	B1	$\Rightarrow$	A1	B1
2nd place	A2	B2		B2	A2
3rd place	A3	B3		A3	A4
4th place	A4			B3	

First Round	Group 1	Group 2		Second Round Group 1	Group 2
1st place	A1	B1	$\Rightarrow$	A1	B1
2nd place	A2	B2		B2	A2
3rd place	A3	B3		A3	B3
4th place	A4	B4		B4	A4

The third draw is organized after the second Round. The Steps 1 and 2 are applied.

11. 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.

12. 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.

13. The Final

Four teams are selected for the Final in the following order:
- the teams winning the both Rounds,
- the teams with the highest ratings R.

The final team rating FR is defined by the following sum:
$$FR = R + 3 \cdot R_F,$$
where R_F is the rating of the team in the final, it is calculated in the same way as the round ratings.

14. Moot points

Any moot point during the tournament is subject to consideration by the Organizing Committee and the Jury.