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Abstracts of Plenary and Invited Lectures

Section:

18. Teaching and Popularization of Mathematics

Round Table

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Difficulties in the Passage from Secondary to Tertiary Education

For an important part of those students who take mathematics courses at the tertiary level, the transition from secondary to tertiary education presents major difficulties. This is true whether students considered are specialising in mathematics or are inscribed in a program for which mathematics is a service subject. The purpose of this round table is to identify possible causes for these difficulties and to suggest actions which could help to improve the situation.

The age at which students pass from secondary to tertiary education ranges in different countries from 17–18 to 19–20 years. But the difficulties met by the students involved in mathematics courses seem to depend more on other elements than on their age.

Here are some of the most widespread sources of these difficulties.

• *The lack of knowledge of specific topics by students.* Students who enter a university class may have very heterogeneous backgrounds, while university teachers often do not care to make sure from the beginning that each one of them masters the basic notions and skills required for an understanding of their course.

• *The sudden change in the ways of approaching the mathematical activity.* Emphasis in secondary school is often on "drill and practice", so that students entering university may lack conceptual understanding. University mathematics, on the other hand, may rest right from the beginning on abstraction, generalisation, reasoning, capability to read, write and speak about mathematical topics. There is a sudden change in the expectations regarding the students' abilities, but this change is often not even made clear to the students.

• *The underestimation of the role of mathematics with respect to future careers.* Many students have chosen a field of specialisation in which they were not expecting to have to study mathematics. The instructor needs to address this issue and convince students of the importance of mathematics for their career.

• *The distorted image of students by teachers.* Many university teachers tend to identify their "average" student with an ideal student who has successfully attended a highly scientific track in one of the best secondary schools. But in an actual class this kind of student may be only a very small minority, or even not exist at all.
• *The lack of pedagogical awareness of some teachers.* In most cases, university teachers have received their professional training as if their main (or only) occupation in mathematics is research. Thus they need to develop by themselves the pedagogical and communication capabilities they will need with their students, which is an arduous task.
Is it possible to overcome such difficulties? And how? The presentations and the discussion during the round table will include identification of possible actions and examination of their merits. Time will be allowed for exchange of views with participants in the audience.