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## Advertisement for mathematical competitions

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Antonella Perucca

Life is full of challenges. We have to perform under time constraints, and we have to give our best. Our performance is often compared to that of others. A mathematical competition for high-school pupils is yet another challenge. And, independently of the outcome, it is valuable training for university admission tests and for university exams in general (are pupils aware of this?).

The so-called mathematical olympiads have various rounds. The best participants are admitted to the next round, then to the national final. And a handful of pupils can participate in the International Mathematical Olympiad (IMO). During this process almost everyone is a loser at some point. It is instructive for pupils to see others who are better, this gives a perspective that one may not gain within one's own class or school.

In any case, pupils should not be discouraged by a less-than-excellent performance in the mathematical olympiads. Luckily, there is no need to score well in order to get a mathematical degree or to be successful later on. In fact, only a fraction of mathematicians are able to solve IMO problems. Moreover, mathematicians mostly don't solve problems under time pressure, they rather develop theories over many years in a collaborative way. And doing research in mathematics requires a broad set of skills. For example, perseverance and creativity. The art of simplifying a complex problem paving the way to the more general case. The capacity of brainstorming and working with others. I believe that pupils could be told all of this.

At least for advanced mathematical competitions, training is crucial. In general, training makes a difference. Of course, pupils should not feel less capable just because others trained more (is there enough awareness on this point?). Extensive training is not for everyone, as it takes will and a lot of time. In fact, some pupils think that they don't like maths enough just because they don't take up mathematical competitions as a serious hobby. However, they could be told that it's perfectly legal to like many different things, and only specialize in one subject starting with the university. Luckily, there is also a middle way: some training is better than no training, and what one learns beyond school mathematics might be helpful later on.

Last but not least, mathematical competitions are social events: they are a way to meet pupils of the same age who share their passion for science. This allows for extraordinary exchanges and it is very inspiring in itself. Some of these friendships last forever.

The author is the organizer of the Luxembourgish mathematical competition "Math Day" for all high-school pupils who like mathematics. The collection of past problems (in English, French and German) is freely available on this webpage: [math.uni.lu/mathday-ex](http://math.uni.lu/mathday-ex)

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