SURPRISE AND HUMOUR IN TEACHING UNDERGRADUATE MATHEMATICS

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Nobody doubts that undergraduate mathematics teaching should be interesting. The elements of surprise and humour can help to solve this problem.

In our view, the most effective and useful surprises are of three types: 1) when the concepts and elements, familiar to students from one mathematical context, appear in another mathematical context, resulting in new contents - new properties of these elements, or other mathematical results; 2) unexpected interpretation (geometrical, graphic, or, on the contrary, algebraic interpretation of the geometrical facts), allowing to look at things from a new viewpoint and to receive, unexpectedly and effectively, new mathematical contents; 3) unexpected applications of mathematical concepts and results in new areas outside mathematics.

As well as in art, the surprises are more effective when they are well prepared. Any concept intended to be considered in a new, unexpected context, earlier should be imprinted on the minds of the students, so that they really could recall it in a new situation. Lecturers might imitate authors of detective stories: the keys to the disclosure of a crime or mystery usually are distributed in different parts of a story, so that the reader, even after overlooking these moments, at once recollects them in a final scene. In mathematics it means that the lecturer, introducing a new concept, should make it unusual, connect it with an interesting example, method or application.

The humour is connected to surprises: to a paradoxicality of the phenomena, unexpected connections of serious with ridiculous. If the purpose of elements of unexpected is to make learning interesting, the purpose of humour is to give ease to the process of learning.

The humour is proper both for oral teaching and for textbooks. Certainly, the elements of humour in oral teaching have features, quite different from those in the textbooks. In oral teaching there is a place to the improvisation, it is possible to use peculiarities of an audience, moment, external circumstances, of a lecturer's own mood. However, in oral teaching the humour frequently is of the external (w.r. to mathematical contents) character, being not related to mathematics and aiming only to create a respite or pause for switching or refreshing attention.

In the textbooks the humour, as a rule, is in greater extent related to elements of the mathematical contents, connecting this contents with non-mathematical (e.g., everyday) things or pushing it together with other intellectual contents (e.g., humanities or other manifestations of the spiritual life), giving birth to paradoxes and amusing contradictions.