DG07: SEMIOTIC AND SOCIO-CULTURAL EVOLUTION OF MATHEMATICAL CONCEPTS

Coordinators

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The history of mathematical concepts is a story of the dialectics between thought and symbolization, a story of creation, re-creation, and refinement of mathematical concepts and patterns of symbolization within different socio-cultural frames and throughout different eras.   The goals of the discussion group are to continue pondering from the semiotic point of view two related issues that emerged in our last discussion group DG7 in Hawaii. These issues are (a) the usefulness of the history of mathematics as a pedagogical tool; and (b) the use of semiotic tools to refine and critique the synchronic and diachronic interpretations of historical texts. Three presentations will situate the discussions in context. These papers will be posted in the group website (http://www.math.uncc.edu/~sae/) at the end of May for reading prior to the conference.

I. *The problem of mathematics education and history of mathematics from a Saussurean point of view*

Michael N. Fried   *Israel*   *15 minutes*

Discussion points   *30 minutes*

1. Is mathematics a semiological system, or is it embedded in a semiological system, or is it similar to a semiological system? Are there pedagogical implications for each of the above three positions?
2. How absolute is the division between the synchronic and diachronic views of a sign system? Does this distinction hold for mathematics taken as a sign system?
3. Are there theoretical difficulties in combining history of mathematics and mathematics education?

II. *Equalities revisited. A pragmatic analysis*

Carlos Vasco   *Colombia*   *15 minutes*

Discussion points   *30 minutes*

1. Are the seven proposed pragmatic intents for equality statements plausible?
2. Can they be reduced to fewer or are there others that might be needed?

III. *Beyond the representation given. The parabola and historical metamorphoses of Meaning*

Christer Bergsten   *Sweden*   *15 minutes*

Discussion points   *30 minutes*

1. What can be learned from the historical metamorphoses of the parabola, as a mathematical object, from classic and analytic geometry to dynamic geometry?
2. The metamorphoses of meaning in the social process of didactic transposition: from being a mathematical object to being an object of teaching and learning.

IV. *Small group discussion and general discussion*   *45 minutes*