

English summaries

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Graphs and relationships

As is well known, a simple nondirected graph is a mathematical object modeling the existence of a certain relation between pairs of elements of a given set. It is therefore not surprising that, at the beginning, many of the results concerning graphs made reference to relationships between a group of people. In this expository article, we comment on four results of this kind, as representatives or as a source of inspiration for various general theories on graphs and their applications. In some cases, such as Hall's marriage theorem, we also describe its relation to other topics of graph theory, as network connectivity.

Keywords: graph, edge coloring, Boolean algebra, Ramsey theory, distance-regularity, codes, Hall's marriage theorem, Menger's theorem.

MSC2010 Subject Classification: 05C50, 05C05.

Bernard R. Hodgson

Herculean or Sisyphean tasks? A renewed look at the incompleteness phenomenon in mathematical logic

The English original of this paper was prepared for the competition «Raising public awareness of mathematics» of the EMS, and appeared in the March 2004 issue of the EMS Newsletter. In it the author explains some modern versions of Gödel's incompleteness theorem, where the incompleteness phenomenon is observed in some customary mathematical contexts, instead of the more formal metamathematical one, which is dominant in the traditional versions.

Keywords: incompleteness, Goodstein sequences, Hercules-Hydra battles.

MSC2010 Subject Classification: 03F40, 00A09, 97A80.

Josep Pla i Carrera

Presentation and analysis of the «Suma de la art de arismetica» by Francesc Santcliment. First part

The main aim of this paper, which will be published in the *Butlletí* in two parts, is to analyze the contents of the book *Suma de la art de arismetica*, a commercial arithmetic written in Catalan and published in Barcelona in 1482, and which has been recently published in facsimile by the *Biblioteca de Catalunya*, Catalonia's main library where the incunable is kept. This will be done in the second part of the paper, while in the present one I will deal with three issues: what is a commercial arithmetic such as Santcliment's, what are the historical antecedents of this kind of arithmetics, and what is their importance in the historical, cultural, social and economical context where they appear, the fifteenth century.

Keywords: history of mathematics in the fifteenth century, commercial arithmetics.

MSC2010 Subject Classification: 01A40, 01A75.

Marta Sanz-Solé

Hitting the bull's-eye with random paths

We introduce the notion of hitting probabilities for random fields and develop a method to obtain upper and lower bounds in terms of the Bessel-Riesz capacity and the Hausdorff measure. After a brief introduction to stochastic partial differential equations, the results are applied to the random fields obtained as solutions to systems of some classes of equations.

Keywords: hitting probabilities, stochastic partial differential equations, capacity, Hausdorff measure.

MSC2010 Subject Classification: Primary 60H15, 60J45; secondary: 60G15, 60G46.
