

Putting math problems in proper order

November 17 2009

Mathematics is driven by the quest to solve problems and today the American Institute of Mathematics (AIM) announces a new tool to help attack those questions. Research problems can take decades or centuries to answer, with partial solutions spawning new problems along the way. Keeping track of all the problems is difficult, even for experts. Sometimes the solution needs an idea from another field, and it can take a long time for someone to notice the connection.

To help address these challenges AIM has developed the AIM Problem Lists. "Old problems need new ideas and the AIM problem lists open up the world of [mathematics](#) to a broader audience," said AIM director Brian Conrey. The problem lists will provide clear statements of problems in the context of related research problems along with expert commentary on possible approaches to a solution. Each problem list provides a snapshot of a specialized area of research.

All versions of the problem lists will be permanently archived through the Harvard IQSS Dataverse Network. "The record of changes to a problem list will provide a moving picture of progress in mathematics research," said Micah Altman, Senior Research Scientist at Harvard's Institute for Quantitative Social Science. These records will allow historians to track developments in a way that previously has not been possible.

The release date for the Problem List tool coincides with the worldwide celebration "RH Day" to commemorate the 150th anniversary of the Riemann Hypothesis -- the most important unsolved problem in

mathematics. One of the new problem lists concerns problems related to the Riemann Hypothesis.

The RH Day celebration will feature more than 50 lectures at 35 locations in 12 countries.

The problem lists are designed to grow and change indefinitely, while maintaining a continuity among the different versions. Problems are assigned permanent numbers and permanent web addresses, which will be of significant benefit to the research literature and to online scholarly ventures. The problem lists will be open to editing by anyone, but with an approval system and oversight by expert editors that provide a guarantee of scholarly integrity.

Development of the problem list tool was made possible by the National Science Foundation CDI grant "Bibliographic Knowledge Network (BKN)," award number DMS0835851. The software running the problem lists will be released open source. The problem list tool was designed by David Farmer in collaboration with BKN team members Micah Altman and Nitin Borwankar.

More information: For more information about the AIM Problem Lists, please visit aimath.org/news/problemlists/.

Frequently asked questions

What is a problem list?

A problem list is an organized and annotated collection of unsolved problems, and previously unsolved problems, in a specialized area of mathematics research. The problem list provides a snapshot of the current state of research in a particular research area, allowing experts to keep track of new developments, and newcomers to gain a perspective

on the subject.

Wouldn't it be easier to just use a wiki?

Wikis were considered as an option for this project. It was determined to be preferable to create a new system than to adapt a wiki to the project's needs for long-term continuity of the problem lists and a multi-layered editing process.

Can I contribute to a problem list?

Anyone can add a remark on a problem, either anonymously or by signing up for a free account. Within the next two weeks, a new feature will be enabled that allows anyone to contribute new problems to a list. All contributions are reviewed before appearing in the publicly viewable version of the problem list. Experts in a particular area can be granted permission to bypass this requirement.

Can I propose a new problem list?

Initial efforts will focus on converting existing problem lists to this new easy to maintain format. If you are already the maintainer of a problem list and wish to use this new tool, please contact David Farmer at farmer(at) aimath.org

Can I use the problem list tool to create other kinds of documents?

The problem list tool is designed for the special structure of a problem list. The BKN project is developing other specialized tools, such as one for maintaining annotated bibliographies that is due for release in Spring 2010.

The BKN Project is also developing a general standard for managing

structured text, called BibJSON (see www.bibkn.org/drupal/bibjson/index.html) which should serve as a foundation for developing more general tools.

Source: American Institute of Mathematics

Citation: Putting math problems in proper order (2009, November 17) retrieved 27 April 2024 from <https://phys.org/news/2009-11-math-problems-proper.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.