

The PIMS Education Programme in BC

Activities for Elementary School Students

Annual PIMS Elementary Grades Mathematics Contest



2002 Grade 7 ELMACON winners

The annual **PIMS Elementary Grades Math Contest (ELMACON)** is open to students in Grades 5–7. It provides an opportunity for students to express their interest and talent in mathematics and to experience mathematics as an exciting sport. Approximately 260 students compete in the contest each year. The top 10 students from the first two written rounds go on to the Countdown round where students duel against each other. It starts with the 9th and 10th ranking students, and the winner of that contest then goes on to “duel” with the 8th place holder. As a result the person who ranked 10th has the potential of winning the contest by beating the 9 people ahead of him/her one by one. The dueling consists of answering math questions against the clock.

Math Mania Evenings

The PIMS University of Victoria site regularly offers an evening of **Math Mania** at schools in the Victoria area. These events attract around 300 students and parents each evening. “Fun” methods, involving games and art, are used to teach math and computer science concepts to children (and adults!). The activities include:

- Exciting Geometrical Models from Straws and Paper
- Mathematical Puzzles
- The Guessing Game
- A Sorting Network
- The Penny Game
- The Set Game
- Soap Bubble Demonstrations
- Bridges of Königsberg



Students playing the Set Game

Forever Annual Math Exhibition (FAME)

Students in the Greater Victoria School District annually participate in **FAME**, the **Forever Annual Mathematics Exhibition**. The exhibits presented at FAME are judged for creativity, skill, dramatic value and mathematical thought. Every entrant is given an award and a school trophy is presented at each of the three levels.



The elementary exhibit at the 2003 FAME

A Contest for Epsilons

The students in the Math and Stat Course Union at the University of Victoria organize annual half-day events entitled **A Contest for Epsilons** for students in grades 5–7 in the Greater Victoria area. The event consists of two contests and seminars on some mathematical topics. Around 150 students take part in the event each year. The students in the course union prepare the competition questions, do the registration and marketing of the event, and give the presentations.

MathClick and MathCircles Workshops at PIMS-UBC

MathClick workshops are full-day mathematics immersion experiential events for students in grades 5–7. The main intention is to awaken children's latent talent and interest by showing them that mathematics can be also playful and intriguing. **MathCircles** is a 17-week follow-up to MathClick. It takes place for 1.5 hours every second Saturday during the fall, and is based on the Singapore Grade 6 programme with modifications.



Student playing a game at MathClick

Activities for High School Students

The Greater Vancouver Regional Science Fair

The Greater Vancouver Regional Science Fair is held at UBC. PIMS supplies judges, mathematical expertise, and prizes. PIMS initiated the inclusion of a Mathematical Sciences exhibit category within the existing science fairs. PIMS is committed to informing and involving mathematics teachers, giving presentations and workshops to groups of students, assisting students that have undertaken mathematics projects, judging the projects, and supplying the monetary awards. The **PIMS BC Math Fair Project Developer** holds Math Fair workshops at schools in the Lower Mainland. A total of 20 projects were submitted in the Computing and Mathematical Sciences category of the 2003 Greater Vancouver Regional Science Fair. Almost all the projects submitted were produced in classrooms where Math Fair workshops were held, and 12 of these won awards.



Gabrielle Arden with her project, Forecasting Weather with Neural Networks

BC Colleges High School Math Contest 2004, University College of the Cariboo



At the BC Colleges High School Math Contest

The **BC Colleges High School Mathematics Contest** was about participation rather than competition. The enrichment talk was given by Frank Ruskey (UVic). His talk was well received by the students, and his “Venn knot” was a great design for the T-shirts. During the morning session with Frank, UCC faculty and high school teachers enjoyed a great discussion on teaching mathematics and the transition from high school to university. While the contest was being held at UCC, one of the UCC faculty members, Jim Totten, who has been a driving force behind this contest for many years, travelled to Northwest Community College in Prince Rupert to assist Mona Izumi with hosting the contest for the first time in Prince Rupert.

ESSO–CMS–PIMS Math Camps at SFU

ESSO–CMS–PIMS Summer Math Camps for High School students took place at the SFU Burnaby campus in 2001, 2002, 2003 and 2004. In 2003 thirty grade 9 and 10 students from 18 Lower Mainland schools were selected from over seventy applications sent by their teachers. For five days, these exceptional students participated in exciting and challenging activities and problem sessions.

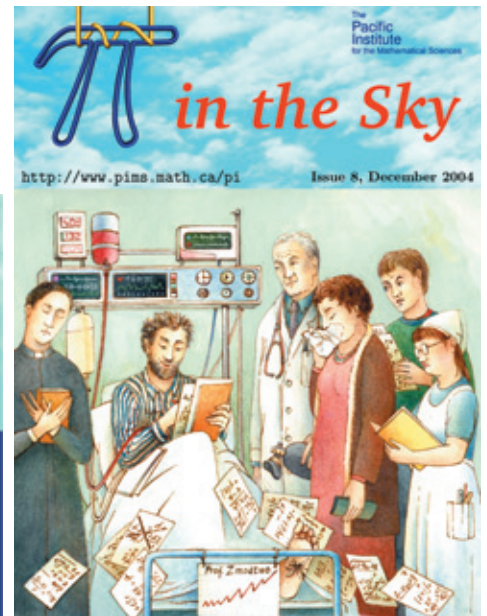
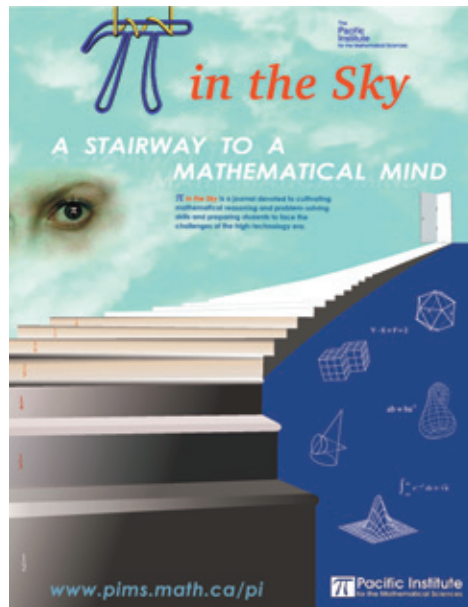
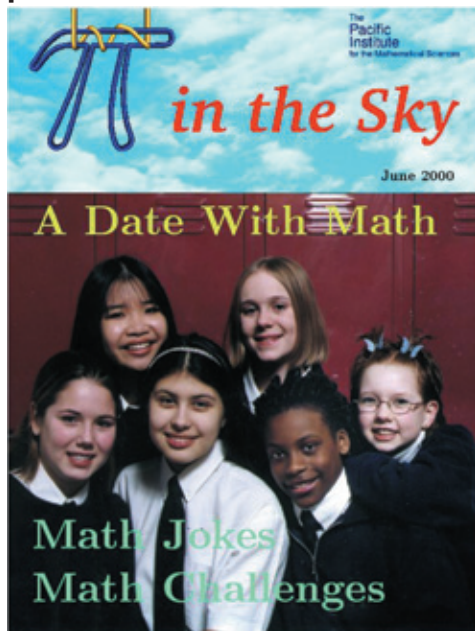


Participants of the 2004 ESSO-CMS-PIMS Math Camp

Pi in the Sky: A Magazine for High School Students

Pi in the Sky Magazine is primarily aimed at high-school students and teachers, with the main goal of providing a cultural context/landscape for mathematics. It has a natural extension to junior high school students and undergraduates, and articles may also put curriculum topics in a different perspective.

Pi in the Sky can be downloaded for free from www.pims.math.ca/pi.



The editorial board is:

Editor in Chief: Ivar Ekeland (UBC)

Managing Editor: David Leeming (UVic)

Editorial Board: Len Berggren (SFU), John Bowman (UA), John Campbell (Archbishop MacDonald Academic High School, Edmonton), Florin Diacu (UVic), Sharon Friesen (Galileo Educational Network, Calgary), Dragos Hrimiuc (UA), Klaus Hoechsmann (UBC), Wieslaw Krawcewicz (UA), Michael Lamoureux (UC), Mark MacLean (UBC), Alexander Melnikov (UA), Volker Runde (UA), and Wendy Swonnell (Lambrick Park Secondary School, Victoria).

Editorial Coordinator: Heather Jenkins (PIMS).

Activities for University Students

PIMS Graduate Studies Information Week

For several years PIMS has sponsored an annual **Graduate Studies Information Week**. The objective is to recruit top undergraduate students from across Canada to enroll in graduate studies in mathematics, statistics and computing science at the PIMS universities. The students are given the opportunities to talk to faculty members and graduate students about their research interests as well as see the campuses of the host universities. Representatives from other PIMS universities also meet the students and give presentations about their programmes.



Discussing graduate studies.

Statistics & Probability in Action, University of Victoria

The **Statistics and Probability in Action** poster session was held in April 2003. Students in an introductory course on probability and statistics interviewed individuals who use statistics and/or probability on a daily basis. The students constructed profiles of the individuals and displayed their work on posters. They explained how the people use statistics/probability in their jobs, what training and education they received, what the joys and challenges of their work are, and much more. Popular subjects for the posters were actuaries and insurance companies, weather forecasters, scientists, and participants in the gambling industry.



Undergraduate Modelling Workshop participants at SFU

Undergraduate Math Modelling Workshops

PIMS supports **Undergraduate Math Modelling Workshops**. Faculty mentors first outline applied problems to all the participants. The students then choose one of the problems to work on each day. Lectures on each of the problems are presented by the mentors, and the tools for the modelling and analysis of the problem are developed. The mentors then help the students develop the models and answer the questions posed. The workshops culminate with presentations by each of the groups.

Activities for Mathematics Educators

Numeracy and Beyond: A Two-Part Workshop

What minimum numeracy is required of the average citizen in this computer age, and how does it relate to the more advanced needs of the engineer or scientist? This two-part workshop addressed this question with a variety of mathematics educators in attendance. The topics included:

- *Numeracy: computation as an intelligent activity*
- *Arithmetical and geometric aspects*
- *The first hurdle: proportion, ratio, fractions*
- *The second hurdle: symbolic calculation*
- *Problem solving as vehicle and goal*



Annual Changing the Culture Conferences at PIMS-SFU

The annual **Changing the Culture** conferences bring together over 90 school teachers, college and university faculty and graduate students, to discuss issues related to teaching mathematics at all levels. The conferences involve a mixture of talks, workshops and panel discussions. Each year the conference has a theme. Past themes include:

- *Do We Need To Teach Algebra?*
- *Mathematics Curriculum: Could Less Be More?*
- *Rigour and Intuition in Mathematics*
- *Writing, Speaking and Thinking Mathematics*
- *Visualising Mathematics*
- *Narrowing the Gap*

Junior Undiscovered Math Prodigies (JUMP) at PIMS-UBC

Junior Undiscovered Math Prodigies (JUMP) is a volunteer based charitable organization that was founded by John Mighton in 1998. Its purpose is to provide free tutoring in mathematics to elementary students, especially those of disadvantaged backgrounds. Over the past seven years, John Mighton has observed many surprising improvements in mathematical aptitude in students enrolled in JUMP, particularly in students with severe learning disabilities.

In April, 2004 John Mighton gave a public talk at UBC: *The Myth of Ability: Nurturing Mathematical Talent in Every Child*. He spoke about the method of instruction used in JUMP and about why he thinks the method works with students who have traditionally struggled with math. This talk is available on the PIMS website in Realvideo format. In July of 2004 John returned to PIMS-UBC to give a follow-up session that covered the JUMP methodology with specific examples from the new workbooks. He also spoke about how one could go about implementing the programme. Further sessions took place in January 2005.

For more information about JUMP please see <http://www.jumpututoring.org/>.