

PROBLEM CORNER

The Department of Mathematics and Computer Science is pleased to announce a project to be known as "PROBLEM CORNER" and to be coordinated by Dr. Tomasz Kaczynski. The aim of the project is to make available to students a set of interesting and challenging problems. Another aim is the encouragement of problem solving.

The basic rules of operation of the project are as follows:

- A set of problems shall be posted at the beginning of each month.
- Solutions to any of the problems will be welcomed until the end of the month and should be submitted in writing to Dr. Tomasz Kaczynski, Memorial-104. (Please slide your submission under the door if Dr. Kaczynski is absent).
- Queries about the project and questions should be directed to Dr. Kaczynski.
- Prizes will be offered to the authors of correct and/or original solutions of any problem at a social gathering at the end of the semester.

SET 1-January 1989

1. Show that the product of three consecutive integers is never a perfect square.
2. There are K people in a class ($K \geq 2$). Show that at least two of them must know the same number of people from among those present. (Assume that if A knows B then B knows A).
3. Solve the simultaneous system of equations

$$\begin{aligned} x_1 + x_2 x_3 x_4 &= 2 \\ x_2 + x_1 x_3 x_4 &= 2 \\ x_3 + x_1 x_2 x_4 &= 2 \\ x_4 + x_1 x_2 x_3 &= 2 \end{aligned}$$

(Explain your work so to make it clear that you obtained all solutions).

4. If $x_0 < x_1$ and for $n > 1$, $x_{n+1} = \frac{x_n + x_{n-1}}{2}$, find $\lim_{n \rightarrow \infty} x_n$. Prove your answer.

Solutions accepted until Wednesday, February 15 (date of posting solutions February 16) Only the first correct solution of a problem qualifies for prize unless other solutions are based on different methods or ideas.

SET 2-FEBRUARY 1989

1. A hat contains 7 ballots labeled with the numbers 1, 2, 22, 23, 24, 25, 26, respectively. We randomly select ballots without replacement until the sum of numbers printed on them exceeds 124. Which value of the obtained sum is most probable?
2. A French boat is fishing on Canadian waters without permission. Each casting of their net into the sea brings a catch of equal value, but during each casting the probability of being caught by the coast guard is $1/k$ where k is a given integer. We assume that the event of being or not being caught during consecutive castings is independent of the number of previous castings. If the boat is caught by the coast guard, all the fish is confiscated and the fishing cannot continue.
The captain plans to return home after n castings. By taking account of the risk, the total gain during the cruise is a random variable. Find the number n which will make the expected value of that random variable greatest.

3. Decide whether the number

$$x = 1 + \frac{1}{10} + \frac{1}{10^2} + \frac{1}{10^3} + \dots$$
 is rational or irrational.

4. Prove that, for each positive integer n , the polynomial

$$P(x) = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots + \frac{x^n}{n!}$$

has no multiple roots (notation $n! = 1 \times 2 \times 3 \times \dots \times n$).
Solutions are accepted until the end of February.

The UPEI Business School Accepts Donation

The UPEI Business School, part of a four university group including Memorial, Acadia, and the University of Moncton, recently received the sum of 5 million dollars from the Atlantic Canada Opportunities Agency. \$1 to \$1.25 million went directly to UPEI.

Bob O'Rourke, Dean of UPEI Business School, says the money will be used to open the Business Institute, a business which will offer counselling, establish a database and provide development case studies for small businesses just starting off.

"The businesses will get counselling in things such as marketing plans, etc... and a case will be developed for each business."

The money was obtained through a proposal submitted by the four universities in January 1988. It was approved in February 1988.

The Business Institute is scheduled to open in April 1989 and will be based downtown on Kent Street. It will prove beneficial to UPEI business students, some of them will be hired, along with faculty members and others to run the business.

By: Ellen Perry

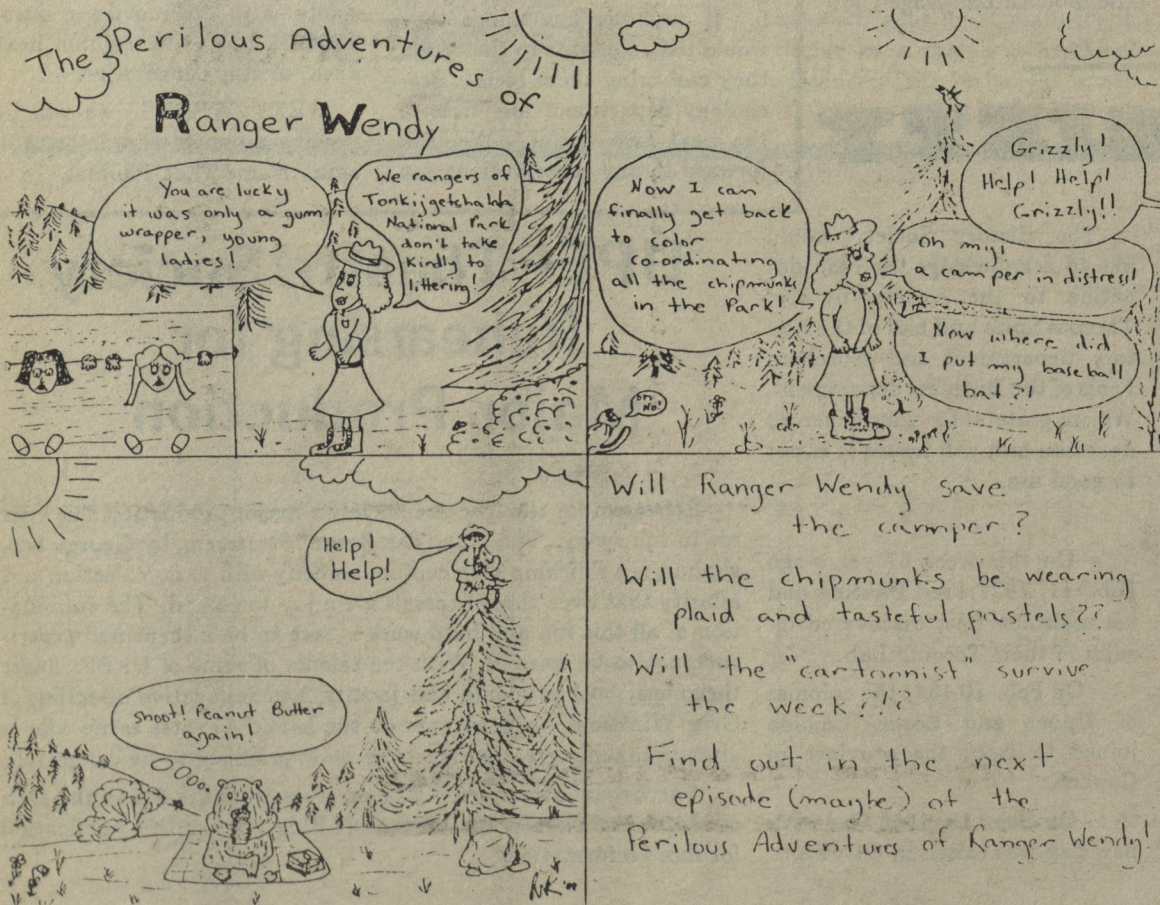
Elections

Student Union elections will be held, March 15 & 16, 1989. Advance polls will open on the 13th and 14th of March. Nominations for positions will open on Feb 17th at 9am. And close on Friday March 3rd at 4pm.

Nominations for the following positions will be accepted beginning Feb 17th. They are as follows:

- Four (4) Arts Representatives
 - Two (2) Science Representatives
 - Two (2) Senates
 - One (1) MAPUS Representatives
 - One (1) Student Ombudsman
- Executive**

- Vice-President Communications
- Vice-President Finance
- Vice-President Operations
- Vice-President Academic
- President



Will Ranger Wendy save the camper?
Will the chipmunks be wearing plaid and tasteful prustels??
Will the "cartoonist" survive the week??
Find out in the next episode (maybe) of the Perilous Adventures of Ranger Wendy!