MathemAttic: An Invitation to Participate

Education Notes March 2022 (Vol. 54, No. 2)

Kseniya Garaschuk (UFV)
Editor in Chief, Crux Mathematicorum

Shawn Godin (Ottawa-Carleton D.S.B., retired)
Editor, MathemAttic; Editor-in-Chief, ATOM

John McLoughlin (UNB)
Editor, MathemAttic

Education Notes bring mathematical and educational ideas forth to the CMS readership in a manner that promotes discussion of relevant topics including research, activities, issues, and noteworthy news items. Comments, suggestions, and submissions are welcome.

John McLoughlin, *University of New Brunswick (johngm@unb.ca)*
Kseniya Garaschuk, *University of Fraser Valley (kseniya.garaschuk@ufv.ca)*

Crux Mathematicorum is an internationally well-known problem-solving journal. Each issue contains original problems for readers to solve, as well as solutions from readers to past problems. It also features other notes of interest to problem solvers including articles, regular columns, and collections of problems from Mathematical Olympiads. What many people might not know is that *Crux* started as a newsletter aimed at high school teachers in Ottawa. The level of problems in earlier volumes made the content broadly accessible as compared to those of recent years including current volumes. Over time the journal evolved to what it is today.

Mathematical Mayhem was a problem-solving journal for students, by students. It was started by Ravi Vakil and Patrick Surry, who had participated in the International Mathematical Olympiad, with an intention of being a journal specifically aimed at that group of people who may be prospective Olympiad participants. The journal ran for 8 years before losing its funding. It was "saved" by *Crux Mathematicorum* and continued as a section of *Crux* for several years.

However by this time, the level of problems appearing in *Mathematical Mayhem* had become increasingly difficult. Earlier scaffolding of problems or a variety of levels had seemingly been replaced by more of an Olympiad flavour. A conscious effort was made to broaden the scope of problem offerings in an effort to reach more secondary level students and teachers. Features such as *Polya's Paragon* and *Problem of the Month* were introduced so as to appeal to a wider audience. At one point in time, there was an attempt to separate *Mayhem* from *Crux* and have it continue online as a free publication. Unfortunately, this did not work out and *Mayhem* was discontinued. Eventually, *Crux* stopped being a subscription-based print journal and took its current form as a free online publication with the link below. The current issue is readily accessible as is a complete digital archive of the entire collection of the journal.

https://cms.math.ca/publications/crux/

The online access offers this journal to a much wider audience than the subscribers who were regular readers. It marked a new beginning of another sort as some of us undertook an initiative to again reach a wider audience. This marked the birth of *MathemAttic*. The remainder of this article is

intended to make the CMS community more aware of this part of the journal. People are encouraged to share this piece with teachers, students and others who may be interested in such a freely available publication. We welcome more problem proposers, solvers, and readers, along with contributors of articles and more. The invitational spirit carries through the subsequent paragraphs. Please get in touch with us with feedback and indications of interest.

MathemAttic, like the latter versions of *Mathematical Mayhem*, is meant to appeal to a range of pre-university students and their teachers. Unlike *Mathematical Mayhem*, it doesn't have a history so it can more easily be created from the ground up. As co-editors, we have been there from the outset.

Currently, M*athemAttic* has a problem section where problems, for the most part, are picked from a wide variety of sources with the occasional problem proposed by a reader. Two regular features have been there from the first year. *Problem Solving Vignettes* explore interesting problems, and their solutions as well as looking at techniques and ideas that would benefit high school problem solvers. *Teaching Problems* focuses attention on problems that have been used in teaching with an eye to how they can develop students' appreciation and learning around mathematical problem solving. This past year, a new feature called *Explorations in Indigenous Mathematics* was introduced with consideration of mathematics pertinent to Indigenous culture.

The journal continues to evolve with the newest feature appearing first in the January 2022 issue. *From the Bookshelf* will highlight books that contributors recommend for inclusion in one's own personal library. The recommendations will offer insight into the selections. In some cases the selections will be more like mini-collections such as the work of a particular author. Longtime *Crux* readers will know that book reviews were staples in the journal for years. This feature will allow for reviews of titles that may interest pre-university students and teachers. This will open the avenue for publishers to send materials along for review. We are also developing a feature that will highlight resources on the internet such as articles, videos, podcasts, or apps of relevance to our target audience.

MathemAttic will evolve further in the coming years with the input and contributions of people interested in the spirit of mathematical problem solving, outreach, and the enhancement of public appreciation of mathematics. The next step in the growth process is the development of a community of people who will act as an advisory board. We are looking to have people from across Canada engage with us in a variety of roles. The need is there for some people to edit the problem submissions, others to assist with editorial roles concerning articles, and generally a collection of people to act as a sounding board for the directions of *MathemAttic*. If you see a way that you would like to contribute, please send us a note (mathemattic@cms.math.ca) as we would welcome hearing from you. The support of the CMS community is appreciated as are efforts to circulate this notice.

Before closing, we share a couple of problems from the March issue. Solutions are welcomed from secondary level students. These can be submitted prior to the end of May through the following link: https://publications.cms.math.ca/cruxbox/

MA162. From an 8×8 chessboard, the central 2×2 block rises up to form a barrier. Queens cannot be placed on the barrier, and may not attack one another across this barrier. Determine the maximal number of Queens which can be placed on the chessboard so that no two attack each other.

MA163. In the diagram, the log A has radius R. A hole of radius r is drilled through the centre of log A at right angles to the axis. Another log B of radius r passes through the hole. Find the length S in terms of R and r.