

35: No 2 March / Mars 2009

Published by:

Canadian Mathematical Society
Société mathématique du Canada
1785 Alta Vista Dr., Suite 105
Ottawa, ON K1G 3Y6
Fax/Télec: 613 733 8994

©CANADIAN MATHEMATICAL SOCIETY 2009. ALL RIGHTS RESERVED.

SYNOPSIS

65 Skoliad No. 115 *Lily Yen and Mogens Hansen*

- Concours mathématique des écoles secondaires de la Colombie-Britannique 2007, Ronde finale, partie B
- British Columbia Secondary School Mathematics Contest 2007, Final Round, Part B
- Solutions to the British Columbia Secondary School Mathematics Contest 2006, Junior Final Round, Part B

71 Mathematical Mayhem *Ian VanderBurgh*

71 Mayhem Problems: M382–M387

73 Mayhem Solutions: M344–M349

78 Problem of the Month *Ian VanderBurgh*

80 The Olympiad Corner: No. 276 *R.E. Woodrow*

Featuring the 19th Korean Mathematical Olympiad 2006; the 55th Czech and Slovak Mathematical Olympiad 2006; the Olympiade suisse de mathématiques 2005; and readers' solutions to some of the problems from

- the XXXI Russian Mathematical Olympiad;
- the Hungarian National Olympiad 2004-2005, Specialized Mathematical Classes, First and Final Rounds;
- the Hungarian National Olympiad 2004-2005, Grades 11-12, Second and Final Rounds;
- the Indian Team Selection Test to the IMO 2002.

102 Book Reviews *Amar Sodhi*

102 *Benjamin Franklin's Numbers: An Unsung Mathematical Odyssey*
by Paul C. Pasles
Reviewed by Jeff Hooper

103 Geometric Constructions of Mixtilinear Incircles

by *Cosmin Pohoăță*

Almost everyone is familiar with the incircle of a triangle and the circumcircle of a triangle. These two circles never meet, as they live inside and outside of the triangle, respectively.

Pick two sides of the triangle and extend these sides to rays emanating from their common vertex. Now imagine that the incircle (confined as it is inside the triangle) becomes restless and that it starts to expand, but that as it expands it keeps in contact with the two rays of the extended sides. As the incircle expands in this way, it will eventually just touch the circumcircle, at which point it stops expanding. It has now become the *mixtilinear incircle* inside the angle between the two rays.

How does one locate the mixtilinear incircles of a triangle?

Here the author gives us not just one, but five different constructions for how to locate the mixtilinear incircles. Don't forget to pull out your compass and straightedge for this one!

Enjoy!!

108 Problems: 3393, 3414-3425

This month's "free sample" is:

3424. *Proposé par Yakub N. Aliyev, Université d'Etat de Bakou, Bakou, Azerbaïdjan.*

Pour un entier positif m , soit σ la permutation de $\{0, 1, 2, \dots, 2m\}$ définie par $\sigma(2i) = i$ pour $i = 0, 1, 2, \dots, m$ et $\sigma(2i - 1) = m + i$ pour $i = 1, 2, \dots, m$. Montrer qu'il existe un entier positif k tel que $\sigma^k = \sigma$ et $1 < k \leq 2m + 1$.

.....

3424. *Proposed by Yakub N. Aliyev, Baku State University, Baku, Azerbaijan.*

For a positive integer m , let σ be the permutation of $\{0, 1, 2, \dots, 2m\}$ defined by $\sigma(2i) = i$ for each $i = 0, 1, 2, \dots, m$ and $\sigma(2i - 1) = m + i$ for each $i = 1, 2, \dots, m$. Prove that there exists a positive integer k such that $\sigma^k = \sigma$ and $1 < k \leq 2m + 1$.

113 Solutions: 3313-3325