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In this Corner are solutions from readers to some problems from
- Youth Mathematical Olympiad of the Asociación Venezolana de Competencias Matemáticas, 2006
- 42nd Mongolian Mathematical Olympiad, 10th Grade
- Olympiade Suisse de mathématiques, 2005, tour final
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301 Lobachevski Revisited
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Reviewed by J. Chris Fisher
Two unsolved problems from *Crux* are reproduced.

Recurring Crux Configurations:  
*J. Chris Fisher*

This new, occasionally appearing column, highlights situations that reappear in *Crux* problems. In this issue problem editor J. Chris Fisher examines triangles for which $2b^2 = c^2 + a^2$. Enjoy!

Summations according to Gauss  
by *Gerhard J. Woeginger*

The paper begins with a well known anecdote involving C. F. Gauss, as a young child, summing the integers 1 through 100. The author illustrates how a method that could be employed with Gauss’ problem can be used to determine various sums and integrals. The method is used on several problems, including one from the 2000 APMO and one from the 1980 Putnam Competition.

A nest of Euler Inequalities  
by *Luo Qi*

For any given $\triangle ABC$, the *antipodal triangle* is defined. Repeating this construction gives a sequence of triangles with circumradii $R_n$ and inradii $r_n$ obeying a generalized form of Euler’s inequality

$$2^n R_n \geq \cdots \geq 2^2 R_2 \geq 2 R_1 \geq R_0 \geq 2r_0 \geq 2^2 r_1 \geq \cdots \geq 2^{n+1} r_n,$$

$(n = 1, 2, \cdots)$, with equalities iff $\triangle ABC$ is equilateral.

Problems: 3650–3663

This month’s “free sample” is:

**3658. Proposed by Ovidiu Furdui, Campia Turzii, Cluj, Romania.**

Let $-\pi < \theta_0 < \theta_1 < \cdots < \theta_k < \pi$ and let $a_j$, $j = 0, 1, \cdots, k$, be complex numbers. Prove that if

$$\lim_{n \to \infty} \sum_{j=0}^{k} a_j \cos(\theta_j n) = 0,$$

then $a_j = 0$ for all $j$. 
3658. Proposé par Ovidiu Furdui, Campia Turzii, Cluj, Roumanie.

Soit $-\pi < \theta_0 < \theta_1 < \cdots < \theta_k < \pi$ et soit $a_j, j = 0, 1, \cdots, k,$ $k$ nombres complexes. Montrer que si

$$\lim_{n \to \infty} \sum_{j=0}^{k} a_j \cos(\theta_j n) = 0,$$

alors $a_j = 0$ pour tout les $j$.

323 Solutions: 3224, 3551–3555, 3557–3562