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SYNOPSIS

1 Editorial *Jim Totten*

2 Contributor Profile: K.R.S. Sastry

3 Skoliad: No. 91 *Robert Bilinski*

- Montmorency Contest 2003–2004
- Concourse Montmorency 2003–2004
- Solution to the 2005 BC Colleges High School Mathematics Contest, Junior Preliminary Round

11 Mathematical Mayhem

11 Mayhem Problems: M226–M231

14 Mayhem Solutions: M163–M174

23 Problem of the Month *Ian VanderBurgh*

25 The Olympiad Corner: No. 251 *R.E. Woodrow*

Featuring the 2003 Vietnamese Mathematical Olympiad; the XXIX Russian Mathematical Olympiad V (Final) Round, 10th and 11th forms; and readers' solutions to some of the problems from

- the XXXVI Spanish Mathematical Olympiad National Round;
- the Taiwan (ROC) Mathematical Olympiad (2000);
- the 2000 Hungarian National Olympiad, first round and final round.

37 Book Review *John Grant McLoughlin*

37 *Hungary–Israel Mathematics Competition: The First Twelve Years*
by S. Gueron

Reviewed by Stan Wagon

38 *Mathematical Adventures for Students and Amateurs*
edited by David F. Hayes and Tatiana Shubin

Reviewed by David G. Poole

39 Some Inversion Formulas for Sums of Quotients

by *Natalio H. Guersenzvaig and Michael Z. Spivey*

In this note the authors establish some formulas for certain sums of quotients of a positive integer n , which are closely related to an identity established by Prévaille-Ratelle in Problem M40 of the April 2003 issue of *CRUX with MAYHEM*. They also establish some elementary facts that are not well known about quotients and remainders.

Their main result is the following theorem.

Theorem. Let n and k be any positive integers with $k \leq n$. Then

$$\sum_{d=1}^k \left\lfloor \frac{n}{d} \right\rfloor - \sum_{d=\lfloor \frac{n}{k} \rfloor + 1}^n \left\lfloor \frac{n}{d} \right\rfloor = k \left\lfloor \frac{n}{k} \right\rfloor .$$

Enjoy!

44 Problems: 3056, 3101–3113

This month's "free sample" is:

3101. *Proposed by K.R.S. Sastry, Bangalore, India.*

The two distinct cevians AP and AQ of $\triangle ABC$ satisfy the equation $AQ^2 = AP^2 + |AC - AB|^2$.

- (a) If $BP = CQ$, show that AP bisects $\angle BAC$.
- (b)★ If AP bisects $\angle BAC$, prove or disprove that $BP = CQ$.

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3101. *Proposé par K.R.S. Sastry, Bangalore, Inde.*

Les deux céviennes distinctes AP et AQ d'un triangle ABC satisfont l'équation $AQ^2 = AP^2 + |AC - AB|^2$.

- (a) Si $BP = CQ$, montrer que AP est une bissectrice de l'angle BAC .
- (b)★ Si AP est une bissectrice de l'angle BAC , démontrer ou réfuter l'égalité $BP = CQ$.

50 Solutions: 2923, 2984, 3001–3007