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SYNOPSIS

449 Mathematical Mayhem *Ian VanderBurgh*

449 Mayhem Problems: M369–M375

451 Mayhem Solutions: M332–M337

457 Problem of the Month *Ian VanderBurgh*

459 The Olympiad Corner: No. 274 *R.E. Woodrow*

Featuring the 47th International Mathematical Olympiad (Slovenia, 2006), problems proposed but not used (Algebra, Combinatorics, Geometry, and Number Theory); Swedish Mathematical Contest 2005/2006, Final Round; and readers' solutions to some of the problems from

- the 17th Irish Mathematical Olympiad;
- the 2007 Italian Olympiad;
- the XXXI Russian Mathematical Olympiad;
- the Taiwan Mathematical Olympiad 2005.

468 Book Reviews *John Grant McLoughlin*

468 *The Symmetries of Things*

by John H. Conway, Heidi Burgiel, and Chaim Goodman–Strauss

Reviewed by J. Chris Fisher

471 Old Idaho Usual Here

by *Robert Israel, Stephen Morris, and Stan Wagon*

From the opening of the article:

Take an arbitrary word using at most 10 distinct letters, such as *DONALDCOXETER*. Can one substitute distinct digits for the 10 letters so as to make the resulting base 10 number divisible by d ? The answer depends on d . If d has 100 digits then the answer is clearly NO. If $d = 100$ then the answer is again NO, since *ER* cannot be 00. If d is 2, the answer is clearly YES: just let the units digit be even; $d = 5$ or $d = 10$ are just as easy.

It gets harder after that. The authors settle the question of which numbers d can always be made to divide a word made from 10 distinct letters if one is free to substitute distinct digits for the distinct letters. For the curious reader there is something unusual about Old Idaho here!

Enjoy!!

478 A Limit of an Improper Integral Depending on One Parameter

by *Iesus C. Diniz*

The author shows how to evaluate the limit of a particular improper integral involving one parameter. The integral arose from the study of multidimensional Poisson point processes, and it cannot be evaluated by switching the order of the limiting process and the improper integral.

Enjoy!

481 Sliding Down Inclines with Fixed Descent Time: a Converse to Galileo's Law of Chords

by *Jeff Babb*

Galileo's Law of Chords states "If from the highest or lowest point in a vertical circle there be drawn any inclined planes meeting the circumference, the times of descent along those chords are each equal to the other". The author addresses the question of whether the vertical circle is the only curve with this property.

Enjoy!

483 Problems: 3371, 3389–3400

This month's "free sample" is:

3389. *Proposé par Mihály Bencze, Brasov, Roumanie.*

Pour $a \in \mathbb{R}$, la suite (x_n) est définie par $x_0 = a$ et $x_{n+1} = 4x_n - x_n^2$ pour tout $n \geq 0$. Montrer qu'il existe un nombre infini de valeurs $a \in \mathbb{R}$ telles que la suite (x_n) est périodique.

.....

3389. *Proposed by Mihály Bencze, Brasov, Romania.*

For $a \in \mathbb{R}$ define a sequence (x_n) by $x_0 = a$ and $x_{n+1} = 4x_n - x_n^2$ for all $n \geq 0$. Prove that there exist infinitely many $a \in \mathbb{R}$ such that the sequence (x_n) is periodic.

488 Solutions: 3229, 3289–3300

505 MAA Book Promotion

506 Year End Finale

508 Index to Volume 34, 2008