OLYMPIAD OMNIBUS

Over fifteen years ago, mathematics students from different countries began meeting for an annual competition called the International Mathematical Olympiad. Australia has sent a team of students to the last two held in Washington & Budapest. The selection of these teams was made by the Australian Olympiad Committee which is currently responsible for the identification, training and selection of the Australian team. Its director is Mr. J.L. Williams of the University of Sydney.

Each state is responsible for its own internal organization; N.S.W. is divided into 4 regions with regional directors

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The state organizer is

Mr. G. Ball,
Dept., of Pure Mathematics,
University of Sydney, 2006.

Amongst other duties, these people help coordinate the examinations which are held in this state: The N.S.W. Mathematical Olympiad, The Interstate Final and The Australian Mathematical Olympiad.

The various Mathematical Olympiad examinations are one stage in a project to encourage talented students in mathematics. In particular, the N.S.W. Olympiad is held to help identify year 11 students who will be encouraged to attend a Summer School each year in Canberra. On the other hand the Interstate Final is used to identify a training squad from whom the Australian Mathematical Olympaid team will be selected.

The types of questions asked in such competitions are not usually syllabus oriented. They are very challenging and it is hoped that students enjoy attempting to solve them. On this premise, we would like to bring such questions to the notice of able students on a regular basis. Students selected for the AMO training squad will receive correspondence from the Director.

An immediate concern is to provide encouragement for younger students who may have either aspirations towards AMO representation or simply an interest and ability in solving challenging mathematical problems. Some such students have been identified already; it is anticipated that others will be identified as the system develops.

The encouragment will take a number of different forms:

(1) *Notification of sources of challenging problems.*

(a) The following books are available from

Mr. P.J. O'Halloran
Canberra C.A.E.

Title	Author	Total Stock	On Order	Cost including postage etc.
Mathematical Gems 1	Honsberger	15	-	$14
Mathematical Gems 2	Honsberger	16	-	$14
Mathematical Morsels	Honsberger	16	-	$14
Mathematical Plums	Honsberger	16	-	$14
International Mathematical Olympiads 1959-1972	Greitzer	71	-	$11
Hungarian Problem Book 1	Rapaport	51	-	$10
Hungarian Problem Book 2	Rapaport	51	-	$10

(b) The following books are available in Australia.

(i) <u>Problems, Problems</u> - Holton & Richard (a collection of problems from past Melbourne University School Mathematics Competitions)

Cost: $6.50 plus postage

Source: Prentice-Hall of Australia Pty. Ltd.,
PO Box 151,
Brookvale N.S.W. 2100.
Telephone: (02) 939 1333.

(ii) <u>Competition Mathematics</u> - Haese and Haese (a collection of 599 challenging problems and their solutions mainly from the MASA Competitions for IBM prizes).

Cost: $8.50 plus postage

Source: M.A.S.A.
C/- S.A.I.T.,
163A Greenhill Road,
PARKSIDE S.A. 5063.

(c) Solutions and comments on previous N.S.W. Olympads are contained in issues of Reflections, the journal of M.A.N.S.W.

1977 Vol. 3, No. 4, 1978 Vol. 3, No. 4, 1979 Vol. 4, No. 4,
1980 Vol. 5, No. 4, 1981 Vol. 7, No. 2.

(d) Crux Mathematicorum: a problem solving journal published 10 month/year by

Algonquin College,
200 Rees Ave.,
Ottawa, Ontario,
Canada K15 0C5.

Interested students may be able to encourage their schools to obtain copies of these sources.

(i) *This Olympiad section will now appear regularly in "Parabola", published by the University of New South Wales.* This section will feature problems, outstanding student solutions and general information. It is hoped that interested students will subscribe to this magazine.

(ii) *Students will be encouraged to send original solutions to Olympaid problems to a mathematician in a tertiary institution in this region.*

(iii) *It is hoped that occasional seminars will be run to enable gifted students to meet their peers and discuss mutual interests.*

It was mentioned earlier that we hope to identify younger talented mathematicians.

Our present source is

(i) Australian Mathematics Competition

(ii) N.S.W. Mathematical Olympiad.

If you are reading this article and are in years 7 to 10, you might like to attempt the following questions:

1. A rectangular floor, whose length and breadth are whole numbers of feet, is tiled. Each tile is one foot square. Find all possible dimensions for the floor such that the number of tiles around the perimeter is exactly half the total number of tiles.
2. In a triangle ABC, a point P is chosen on AB such that P is between A and B and is nearer to A than to B. Points Q, R and S on AC, CB & BA respectively are such that PQ is parallel to BC, QR is parallel to AB & RS is parallel to CA. Calculate the maximum value that the area of quadrilateral PQRS could have as a fraction of the area of triangle ABC.

You should state clearly the reasons for your answers. Solutions should be sent to the state organizer.

Solutions to these questions will appear in the next Parabola along with other Olympiad Information.