from Preparatory schools, including some Head-Masters. Many Preparatory School Masters are members of the Mathematical Association and S.A.T.I.P.S. would welcome Public School masters as Associate members of their society for an Honorary Membership Fee of 5/- a year. Expenses for Conferences are of course extra, usually about 4 guineas, for accommodation and meals. Details of Membership may be obtained from J. B. Maplin Esq., The Pound, Blatchington, Seaford, Sussex. He will of course, send further details of Conferences to members.

Yours etc., JOHN WILLIAMS

Little Thorns, Gatton Point
Redhill, Surrey

To the Editor of the *Mathematical Gazette*

DEAR SIR,

Readers of the *Gazette* may be interested to have some information about Mathematical competitions, which have gained increasing support, in recent years, in the Soviet Union and the U.S.A. Usually they have a twofold object—to detect emergent mathematical ability and to stimulate interest in the subject. The Eötvos Prize competition, which has been held annually in Hungary from 1894 to the present time (with minor exceptions) is the classic example, and it has been remarked that Hungary has produced many outstanding mathematicians, several of whom were Eötvos prizewinners. [See the articles referred to below.] The Russian Mathematical 'Olympiads' began in 1934 in Leningrad; today about ten different competitions are organised by the University centres. Some 1000 students aged 14–18 are annually involved in the Moscow Olympiad. Several Mathematical Contests are currently held in the U.S.A.—of these the best known are the Putnam competition (at undergraduate level), the Stanford University competition conducted by Prof. G. Polya, and the National High School Contest sponsored by the Mathematical Association of America. This latter contest, of which some details are given below, involves only basic algebra, geometry and trigonometry (i.e. O level with minor exceptions caused by syllabus differences). In 1960 some 150,000 students in American and Canadian High Schools took part. Further information about mathematical competitions is contained in articles in the *American Mathematical Monthly*, March 1959 and May 1960 and in *Mathematics Teacher*, December 1958.

Details of the National High School Contest

This is a multiple choice test lasting 80 minutes in which wrong answers are penalised so that random choice would produce zero score. Marking is simple and standardised. Outstanding individual performances are published and several medallions awarded. The three best papers in any participating school are totalled to give a 'team score' though the Contest is not envisaged as an inter-school competition. Coded results are published in order that participating schools may discover their relative status. The test usually consists of 40 questions, arranged in increasing order of difficulty Some specimen questions follow (1960).

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(4) Each of two angles of a triangle is 60° and the included side is 4 inches. The area of the triangle, in square inches, is:

(A) $8\sqrt{3}$ (B) 8 (C) $4\sqrt{3}$ (D) 4 (E) $2\sqrt{3}$

[The letter of the correct answer, 'C', is to be written in a space on the answer sheet.]

(17) The formula $N = 8 \quad 10^8 \quad x^{-3/2}$ gives for a certain group, the number of individuals whose income exceeds x dollars. The lowest income, in dollars, of the wealthiest 800 individuals is at least:

(A) 10^4 (B) 10^6 (C) 10^8 (D) 10^{12} (E) 10^{16}.

(27) Let S be the sum of the interior angles of a polygon P for which each interior angle is $7\frac{1}{2}$ times the exterior angle at the same vertex. Then

(A) $S = 2660°$ and P may be regular (B) $S = 2660°$ and P is not regular (C) $S = 2700°$ and P is regular (D) $S = 2700°$ and P is not regular (E) $S = 2700°$ and P may or may not be regular.

(34) Two swimmers, at opposite ends of a 90 ft. pool, start to swim the length of the pool, one at the rate of 3 feet per second, the other at 2 feet per second. They swim back and forth for 12 minutes. Allowing no loss of time at the turns, find the number of times they pass each other.

(A) 24 (B) 21 (C) 20 (D) 19 (E) 18.

(39) To satisfy the equation $\dfrac{a+b}{a} = \dfrac{b}{a+b}$, a and b must be:

(A) Both rational (B) both real but not rational (C) both not real (D) One real, one not real (E) one real, one not real or both not real.

It has been suggested that some schools in this country might like to participate in this competition. I should be glad to supply further information to anyone who is interested.

Yours etc., F. R. WATSON

Manchester Grammar School

To the Editor of the *Mathematical Gazette*

DEAR SIR,

May I congratulate N. de Q. Dodds on discussing the matter of elementary division and the method of setting it out? While not sure that he has the answer as regards setting out, I am convinced that some reform is most desirable. It is extremely confusing to a poor pupil to find that sometimes the divisor is on the left, $23\overline{)4187}$, sometimes on the right, $4187 \div 23$ and sometimes underneath $\dfrac{4187}{23}$. No wonder pupils will write $4187 \div 23$ or $23 \div 4187$ indiscriminately.

Some people think that if a pupil is so poor that at the age of 13 or so he is still confused about division, then one should not bother about him (or her). But it is quite possible in this country for girls who are poor mathematically to train as primary school teachers and thus pass on their own confusion.

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