

Preface

Every year numerous requests are received for copies of the questions presented at the annual meets of the American Regions Mathematics League and the New York State Mathematics League. Teachers and students on the junior high school level, the high school level, and the college level from all parts of the country and from as far away as France, Hungary, Scandinavia, Yemen, Australia, and Singapore have requested copies of these questions. To satisfy this constant demand, this book is being published.

The publication of this collection of questions is also a symbol of many achievements. It represents the establishment of numerous mathematics leagues, contests, and fairs throughout the very large geographical area involved in the meets at which these questions were posed.

Many dedicated teachers gave many hours of their free time to found and foster these local competitions. Yet these local competitions represent only the first stage of a structure of interscholastic mathematics competition that is emerging in our country. The next stage is exemplified by the New York State Mathematics League, a league involving many of the leagues within the state.

However, though statewide, and even interstate competitions, such as the New England Mathematics League, involving all six of those states, are now functioning, another, much more encompassing stage has been created in mathematics competitions. The American Regions Mathematics League (formerly Atlantic Region Mathematics League) was formed with the collaboration of the New York State Mathematics League, the New England Mathematics League, and leagues from New Jersey, Pennsylvania, Maryland, and Virginia. It has proved so popular that it continues to grow each year, and presently encompasses the Atlantic coast states from South Carolina to Maine, as well as West Virginia, Michigan, Illinois, and Texas. In 1988 nearly 1000 students and teachers attended the American Regions Mathematics League meet now held at two separate sites simultaneously.

Such a broad coverage of states is truly noteworthy because this competition is not presented to students in their own schools, or in a nearby school. The purpose of the American Regions Mathematics League is to bring together the leading mathematics students of each state, where they may meet one another, socialize, and compete, and then, in the presence of their peers, receive recognition, awards, and accolades they so well deserve. The students and coaches arrive at the host university on a Friday afternoon or evening, may partake in sports from Frisbee to swimming in the university pool, and attend a social and listen to guest speakers in the evening. Friday night the students are housed in the university dormitories, and after breakfast Saturday

morning, the various competitions continue, with a break for lunch, till 3:00 p.m., when the awards program is held. Representatives of our sponsors, such as the National Council of Teachers of Mathematics, the Mathematical Association of America, Mu Alpha Theta, and the National Council of Supervisors of Mathematics, are in attendance to present awards generously donated by these organizations.

Despite the trepidations of those who blanched at the sizable expenses, the travel arrangements, the dormitory and dining arrangements, and a host of other logistical problems, the American Regions Mathematics League is now in its fifteenth year and steadily expanding. The excitement generated at these annual meets, the encouragement given our most promising students, the creation of an atmosphere charged with mathematics, are most gratifying to all of us who work in this field.

Perhaps, in the near future, a greater, grander stage will be achieved—the formation of a National Mathematics League. It seems only a matter of time.

Meanwhile, enjoy the problems given in these pages. Remember, they were posed, not to stump you, but to provoke your mathematical ingenuity, to guide you to clever tricks and new methods of attack, to open new facets of topics to the uninitiated, and to offer you the unique joy that only the solving of a truly challenging problem can bring.

We are grateful to Eugene Levine and Neil Shell, who have served as reviewers of the questions for many years. Their helpful comments and suggestions have been most appreciated. In addition, Professor Levine has contributed material that became the basis of several power questions. We also wish to thank the NCTM editorial staff for their support and guidance through the process of developing the book for publication.

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