BOOK REVIEW

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THE HOUGHTON MIFFLIN MATHEMATICS ENRICHMENT SERIES

Last month, three books in the Houghton Mifflin Mathematics Enrichment Series were reviewed:

1. *Stereograms* - Stover
2. *Mosaics* - Stover
3. *Legislative Apportionment* - Meder

This month the last four booklets in the series are reviewed.

The 52-page *Topics from Inversive Geometry* by Albert E. Meder, Jr. deals with transformations of a fixed circle, in a plane. A transformation is defined as a pairing of points, according to some law or rule. The problem of transformations is dealt with in three ways: intuitively, algebraically, and geometrically. The book, therefore, lends itself to various levels of treatment by a teacher.

Most of the work on transformations is done using the Cartesian coordinate system in two dimensions. However, polar coordinates and three-dimensional transformations are discussed. Though the topics are presented in a simple manner in the first part of the book, later treatments require some knowledge of trigonometry, general equations for lines and circles, locus parabolas and other conics. The book should be useful at any secondary level.

Sequences is an 84-page book by Katherine E. O'Brien. It is designed for students having about two years of algebra and geometry. Topics covered include: Euler's ϕ Function; recursive definitions of sequences; π and e; and harmonic series. The treatment of the sequences brings in such concepts as function relationships, successive differences between members of a sequence, generalized algebraic terms of a sequence, bounds and limits.

Many theorems, relating to sequences, are presented, but many are not proven. It is suggested that students apply the theorems to different sequences to see that they work. The book would likely be useful to high school teachers who wish to provide further experiences for their students.

Another useful book for the high school mathematics teacher is *Induction in Mathematics*, by Louise Johnson Rosenbaum. The pamphlet is quite short (30 pages) but it comprehensively covers the topic of inductive proof. The rationale behind the method is adequately presented, and there are many excellent examples discussed and problems given. The presentation in the book might be followed by a teacher, rather than that of most texts.

Fibonacci and Lucas Numbers, by Verner E. Hoggatt Jr., is the last of the seven books in the series. The concept of Fibonacci numbers is developed in context with a problem of finding out the number of rabbits produced, given the breeding rate of rabbits. Various forms of Fibonacci numbers are discussed - those arising from work with the "Golden Section" of a line, as well as those arising from geometrical work with triangles and rectangles.

The different methods of generating Fibonacci and Lucas numbers are discussed, along with proofs of various theorems dealing with the numbers. The last part of the book relates Fibonacci and Lucas numbers to other mathematical areas such as Pascal's triangle; 2 x 2 matrices; completeness property of sequences; identities, periodicity and divisibility.

The series of books would be an interesting and useful addition to a teacher's library or a school library. Many students would enjoy working through the books on their own, and most teachers would find the different topics and their approaches worthwhile incorporating into their own lessons.