Algebraic Curves, by J. Semple and G. T. Kneebone. Oxford, 1959.

This book for students in their final undergraduate or early post-graduate years covers the classical theory of algebraic curves in complex projective space (plane and higher dimensional). This is done in ten chapters, with an additional eleventh chapter entitled "Local Geometry in S_2" giving a sketchy account of the theory of infinitely near points after Enriques-Chisini with references to Zariski's version of the theory.

The first two chapters introduce the theory of tangents and polars, and of intersections of plane curves through Bezout's theorem. This last is proved in much the same way as in Van der Waerden's classic book on algebraic geometry. The theory of resultants is presupposed and the definition of multiplicity of intersection is based on it.

After introducing points whose coordinates may be transcendental over the ground field in chapter III, chapters IV and V deal with points whose coordinates are formal power series, that is with the theory of branches. It is shown that the multiplicity of intersection of two curves at a point is the sum of the multiplicities of intersection of their branches with centres at that point, and Zeuthen's rule is derived. Puiseux's theorem on fractional power series expansions is proved in an appendix.

Chapter VI, on the class and deficiency of plane curves, contains an unusually clear statement and proof of the fact that mapping a point of a curve onto the tangent at that point gives a birational correspondence between the curve and its dual. The chapter also contains Noether's theorem on the reduction of singularities of plane curves (to ordinary singularities) by standard quadratic transformations. The properties of the latter are presupposed.

Chapter VII discusses the function field of an irreducible curve, chapters VIII and IX deal with curves in higher dimensional space and their associated forms. Chapter X deals with linear series and the theorem of Riemann-Roch, differentials being defined in terms of formal differentiation of power series.

The book assumes without proof, in addition to the things already mentioned, the Weierstrass preparation theorem for formal power series and the theorem on extension of specializations. The elimination theory in Weil's "Foundations" is mentioned.

https://doi.org/10.1017/S0008439500026539 Published online by Cambridge University Press

The great virtue of this book is that every chapter is followed by a lengthy set of exercises. Some of these provide routine examples, some contain matters usually treated as theory, such as the Plücker formulae and the Cayley-Bacharach theorems.

The book assumes a strictly geometric (one is tempted to say old fashioned) point of view, though numerous references are made to more algebraic procedures, and a bibliography is provided to allow the student to follow these up.

D. Sussman, McGill University

Mathematical Discovery, vol. I, by George Polya. Wiley, New York, 1962. xv + 216 pages. $3.95.

This book is a continuation of the author's two earlier ones, How to Solve It and Mathematics and Plausible Reasoning; its level of presentation, however, seems to be somewhere between that of these other two.

One of the purposes of the book is to give high school mathematics teachers and students an opportunity to develop insight and to acquire experience in a methodical approach to problem-solving. Much of the material is based on seminars in problem-solving that the author has conducted in recent years.

The book is divided into two parts. The first four chapters, comprising part one, consist of the presentation of the solution to a few problems. The problems are chosen so that a careful examination of the solutions suggests a general pattern which is finally formulated explicitly. Some of the types of problems treated are those involving the intersection of two loci, recursion, and superposition. The remaining two chapters form the introduction to part two in which is discussed the general procedure of analyzing a problem in attempting to discover a solution. A second volume is to appear, containing the rest of part two.

Each chapter concludes with a selection of interesting and non-routine problems (solutions are provided) designed to enable the reader to improve his ability to solve problems, and which form, perhaps, the most valuable element of the book.

J. W. Moon, University of Alberta