Höhere Mathematik. Teil III. *Raumkurven und Flächen. Linienintegrale und mehrfache Integrale. Differentialgleichungen nebst Anwendungen.* By Rudolf Roth. Leipzig, Teubner, 1935. ix+238 pp.

Teil IV, Heft 3. *Aufgabensammlung: Integralrechnung.* Leipzig, Teubner, 1936. 49 pp.

A clear, concise, and careful presentation of topics of the grade of advanced calculus is contained in the first volume under review. The three subjects treated include the fundamental results of differential geometry of the first order with respect to space curves and surfaces, vector methods being used wherever possible; a treatment of line and multiple integrals including the theorems of Stokes, Gauss, and Green; the principal elementary considerations of ordinary differential equations, including indications of approximate and graphic methods of solutions, and a few remarks on partial differential equations, limited mainly to the fundamental equations of mathematical physics. The volume is replete with illustrations from the applications. The author maintains a high standard of rigor in his presentation, including an existence theorem for multiple integrals of continuous functions and for a system of differential equations. There are many mathematical side glances, to add interest to the presentation, for example, a mention of the Möbius strip, Schwarz's proof that the area of a surface is not always the least upper bound of the areas of inscribed polygons, a discussion of the n-dimensional volume of an n-dimensional sphere, a treatment of the problem of pursuit, and so on. The author has produced an excellent treatise in small space, containing more than the essentials of the subjects considered.

The second volume under review is a collection of examples to cover the integral calculus part of the treatise. The plan of the collection follows the form of the previous parts, exercises being succeeded by their solutions, and many exercises already found in the text being included. The collection is suggestive in giving a number of applications not usually found in texts on the calculus in this country. One defect is that frequently other and better solutions of the problems can be found than those given.

T. H. Hildebrandt

Sur les Classes d'Idéaux dans les Corps Quadratiques. By S. Iyanaga. (Actualités Scientifiques et Industrielles, No. 197.) Paris, Hermann, 1935. 13 pp.

This pamphlet, one of the series published in memory of Jacques Herbrand, contains a discussion of the following theorem due to L. Rédei: A necessary and sufficient condition for the existence of an ideal class (in the restricted sense) of order 4 in a quadratic field $k(\sqrt{D})$ is that the discriminant of the field may be written as the product of two factors, $D=D_1D_2$, such that all the prime factors of the discriminants of $k(\sqrt{D_1})$ and $k(\sqrt{D_2})$ decompose completely in $k(\sqrt{D_2})$ and $k(\sqrt{D_1})$ respectively. The proof, based on the translation theorem of Hasse for class fields, is given in detail and in simple form. The form of the proof leads to a generalization relating the number of basis elements of order 2^r, $r\geqq 2$, of the class group of $k(\sqrt{D})$ and the number of decompositions of D with the Rédei property. An appendix contains applications to the determination of the sign of the fundamental unit in real quadratic fields.

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