In the fifth and last chapter deformations of locally simple curves are studied. The main theorem that two locally simple curves can be deformed into each other (by an admissible transformation) if and only if they have the same angular order is proved in its full generality. An admissible transformation is defined as one under which the intermediate curves are uniformly locally simple. The same question is treated for the case of O-deformations under which the curves are not allowed to pass through a point O. Here the characteristics are the angular order and the order with respect to O. These are of course highly important questions whose systematic treatment in the non-regular case has been long overdue.

There is finally a brief introduction to the deformation for interior transformations which has been more extensively treated in the author's joint paper with M. H. Heins (Acta Math. vol. 80 (1947)). This interesting theory aims at a complete characterization of the homotopy properties of meromorphic functions as opposed to those of more general interior transformations. As an introduction to this theory the book serves a very laudable purpose.

L. AHLFORS

Vector and tensor analysis. By Louis Brand. New York, Wiley, 1947. 9+439 pp. $5.50.

This volume bears a relation to the average elementary book on vector analysis similar to the relation of the author's well known *Vectorial mechanics* to the average elementary book on mechanics. In each case all of the expected topics are included and treated thoroughly, carefully, and with rigor and sophistication. But a number of related subjects are brought into the picture.

Thus in the volume under review one finds chapters on motor algebra, quaternions, dyadics, the application of vectors to perfect fluids and to elementary differential geometry. A long chapter on tensor analysis carries the subject beyond covariant differentiation and includes surface geometry in tensor notation. The author expects to include further applications of tensor analysis such as those made by Einstein and Kron in a later volume.

Many exercises are worked out in the text. These often include interesting results not found in conventional texts. These, together with some of the exercises to be worked out, should do a great deal for the reader interested in increasing the breadth of his mathematical education.

The book can be used as the basis of an elementary course in vector

or tensor analysis. It would be particularly valuable for those students of superior ability who have the time and inclination to read beyond the minimum requirements.

Professor Brand has made an interesting and original selection of topics, and his treatment of them should prove satisfactory and useful to the mathematical public.

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