203. A. M. Gelbart: *Bounds for pressure in a two-dimensional flow of an incompressible perfect fluid.*

It is known that the problem of the pressure distribution along a wing in the case of a two-dimensional flow of an incompressible perfect fluid can be reduced to the problem of determining the function which maps the exterior domain into the exterior of a circle. This paper deals with some properties of the function in the neighborhood of the angle of the wing. Bergman treats this problem by employing orthogonal functions and certain special transformations. (See abstract 48-5-200.) Using this approach, some inequalities previously obtained by the author for the coefficients of the mapping function, and a minimum integral, inequalities for the velocity in the neighborhood of the angle are obtained which depend only upon a suitable domain in which the boundary of the profile lies. (Received March 7, 1942.)

204. W. A. Mersman: *Heat conduction in a finite composite solid.*

The problem of one-dimensional heat conduction in a composite wall has been solved by Churchill (Duke Mathematical Journal, vol. 2 (1936), pp. 405–414, and Mathematische Annalen, vol. 115 (1938), pp. 720–739), the solution being presented in the form of a series which converges rapidly for large time values. The present paper furnishes a transformation of Churchill's solution in the form of a series which converges rapidly for small time values. This is done by expanding the Laplace transform of the solution as a geometric series and inverting term-by-term, instead of applying the Mittag-Leffler theorem and the inversion theorems of Doetsch and Churchill. (Received February 19, 1942.)

205. W. A. Mersman: *Heat conduction in an infinite composite solid with an interface resistance.*

The problem of one-dimensional heat conduction in a doubly infinite composite solid with an interface resistance is solved by the Laplace transformation method. The interface conditions are: (1) the product of conductivity and temperature gradient is continuous across the interface; (2) the temperature discontinuity across the interface is proportional to the product in (1) above, the factor of proportionality being a constant. (Received February 9, 1942.)

Geometry

206. Herbert Busemann: *Spaces with convex spheres.*

In a metric space a continuous curve which is locally isometric with a euclidean straight line will be called a geodesic. The paper considers a finitely compact metric space in which there is exactly one geodesic through any two different points. With an obvious definition of a tangent of a sphere a sphere is called convex if no tangent of the sphere contains interior points of that sphere. Assume that all spheres are convex and that the space has dimension greater than or equal to 3. The space is congruent to an elliptic space, as soon as at least one geodesic is closed. If all geodesics are open, convexity of the spheres as defined above coincides with the usual idea that a segment whose end points are in a sphere lies completely in the sphere, but the space is not necessarily flat. However if the parallel axiom (properly formulated) holds, the space is flat and its metric is Minkowskian. (Received March 20, 1942.)