Letter to the Editor

1961

SovietRxiv

Abstract

Full Text

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In *Doklady AN SSSR* there was published a paper by G. E. James-Levy, "On the Problem of General Anamorphosis" ([1]). In the indicated paper there are a large number of incorrect and unclear assertions. The author' s constructions, after certain restrictions and corrections, can at best be justified only from a "local" point of view.

1. The article says: "Equation (1) we shall sometimes write in the form $x = \theta(y, z)$ or $y = \Phi(x, z)$." However, it is obvious that the possibility of such a notation in no way follows from the assumptions previously made by the author.
2. Wishing to exclude the case when, in the nomogram under consideration, the scale x is a straight line, the author asserts that the curvilinearity of the scale x "is characterized by conditions (5)." These conditions are erroneous. They are not satisfied, for example, at any point of the parabola $u = x,\ v = x^2$.
3. The article derives equations (10) and (12), which the functions $\varphi_3(z)$ and $f_3(z)$ must satisfy. However, these equations are derived incorrectly.

In fact, it is not difficult to verify that, for example, the function $z = \dfrac{x + y - xy}{1 - (x + y)}$, for $x + y \neq 1$, makes the determinant

$$\begin{vmatrix} x & x^2 & 1 \\ y & y^2 & 1 \\ 1+z & z & 1 \end{vmatrix}$$

identically equal to zero; moreover, the functions $f_1(x) = x^2$ and $\varphi_1(x) = x$ satisfy all the conditions required in the article, and nevertheless the functions $\varphi_3(z) = 1 + z$ and $f_3(z) = z$ do not satisfy equation (12).

4. Having derived the system of differential equations (10) and (12), the author asserts that "in the general case, from this system are determined the functions $f_3(z)$ and $\varphi_3(z)$, depending on 4 constants of integration." In reality, however, the system of equations (10), (12) determines a solution only locally; a solution defined on the entire interval of variation of the variable z for this system exists only in exceptional cases. Even when it is known that the system (10), (12) has a solution defined over the whole domain of variation of z, it remains unclear how to find it. The method proposed by the author for selecting the required particular solutions is based on a misunderstanding: the author proposes to use a general integral

of the system; but a general integral of the system (10), (12) in the entire domain under consideration will, generally speaking, not exist.

5. The reasoning in the derivation of equations (10) and (12) applies only to those values of z that are assumed by the function $F(x_0, y)$. The author nowhere indicates this.

Similar remarks also apply to all the cases considered by the author.

In conclusion, it should be noted that the solution of the problem posed by the author—of finding functions $\varphi_1(x)$, $f_1(x)$, $\varphi_2(y)$, $f_2(y)$, $\varphi_3(z)$, and $f_3(z)$ satisfying identity (4)—is of real interest only under the assumption that from its solution it is possible to obtain an actual nomogram, which is not always the case.

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Cited Literature

[1] G. E. James-Levy, DAN, 113, No. 2, 258 (1957).

From the Editors. The authors of the letter first drew the editors' attention to the errors indicated in the letter in G. E. James-Levy' s article in June 1958.

Note: Figure translations are in progress. See original paper for figures.