
Second Meeting, 12th December, 1902.

Dr THIRD in the Chair.

Mathematical Correspondence.

ROBERT SIMSON, MATTHEW STEWART, JAMES STIRLING.

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On the Uniqueness of Solution of the Linear Differential Equation of the Second Order.

By Dr PEDDIE.

1. In many problems of physics, even in widely different branches of the subject, the relation satisfied by the variables is expressible by means of a linear differential equation of the second order. In general, "initial" conditions have also to be satisfied. If the equation truly represents the physical conditions in, for example, some case of motion, and if no state of instability exists, the solution must be unique. But it is impossible in any case to say with absolute certainty that the representation is strict. The possible error depends on the error which may be made in observation or experiment, and on the number of independent observations or experiments the results of which have been used as the basis of the "law" expressed by the equation. The probable accuracy of any statement as to the non-existence of instability is also dependent on the rigour and extent of the observational or experimental groundwork. The physicist therefore frequently assumes a form of solution which suits his conditions, and does not trouble himself to enquire whether or not other solutions exist if he finds that the one which he has obtained corresponds sufficiently closely to his facts. This procedure is thoroughly justifiable, seeing that he is as sure of the accuracy of his result as he is of the accuracy of his