

# ALGEBRAIC PROOFS OF THE RIEMANN-ROCH THEOREM AND OF THE INDEPENDENCE OF THE CONDITIONS OF ADJOINTNESS<sup>1</sup>

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## § 1.

The methods which I employ in the present paper are essentially those of which I have already made use in a paper *On the Reduction of the general Abelian Integral*.<sup>2</sup> They are purely algebraic in their character and furnish a very elementary introduction to the theory of the algebraic functions.

The substance of this paper was presented at the meeting of the Chicago Section of the American Mathematical Society held in Chicago in December 1900.

Let

$$(1) \quad F(z, u) = \sum_{r,s} e_{r,s} z^r u^s = 0$$

be the equation to an irreducible algebraic curve of degree  $n$ . We shall assume that the multiple points of our curve are all double points with distinct tangents and separate from the branch points, that the asymptotes are all distinct from one another and none of them parallel to the axis of  $u$  and no two parallel to each other.

Any irreducible algebraic curve, as we know, can be transformed to this form by a birational transformation. The variable  $u$  we shall regard throughout as the dependent variable. The coefficient  $e_{0,n}$  of  $u^n$  will on

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<sup>1</sup> See note at end of paper.

<sup>2</sup> Transactions of the American Mathematical Society, Vol. 2.