

# *Weierstrass' Characteristic and Covariant Constant Vector Fields III<sub>a</sub> . Equivalence Subclasses\**

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**1. Problems to be solved. Prerequisites.** This paper is a continuation of two papers [10] [11] of the same title.\*\* The problems discussed here may be formulated as follows:

I. In the papers [7][8][9] we have shown how to construct a curvature tensor out of its characteristic. In [8] we mentioned some cases which were left out because their construction was rather obvious. (See Remarks [9](2.2), [9](2.3), [9](3.2).) These cases were briefly discussed also in the Appendix of [11]. Here we shall investigate in detail the relationship of the curvature tensors so constructed. This requires also a refinement of the concept of the *Ch*-equivalence class.

II. Given a curvature tensor and its *metric* tensor we shall find a mixed system of intrinsic differential equations for another metric tensor which gives rise to another given curvature tensor of the same equivalence subclass.

Although this investigation is based on the known results of the papers [10][11][7][8][9] we shall repeat in the sequel some prerequisites for the convenience of the reader.

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Because of technical reasons this paper appears in two parts, III<sub>1</sub> and III<sub>2</sub> . The first part contains the first five Sections, the second part published later contains the remaining Sections 6–10.

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a) Lower case Greek (Latin) indices run from I to IV (1 to 6). Only the indices  $x, y, z$  do not follow the usual summation rule. Upper case Greek (Latin) indices run from  $\dot{\text{I}}$  to  $\dot{\text{VI}}$  ( $\dot{\text{I}}$  to  $\dot{\text{VI}}$ ). Lower case German indices run from  $\dot{1}$  to  $\dot{4}$ .

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\*\* These papers will be denoted in the sequel by I, II, resp.