47. On the Curves Developable on Two-dimensional Spheres in the Conformally Connected Manifold.

By Kentaro YANO and Yosio MUTÔ.

Mathematical Institute, Tokyo Imperial University.

(Comm. by S. KAKEYA, M.I.A., May 12, 1942.)

In two previous papers[1], we have obtained the following Frenet formulae:

$$(1)\qquad \begin{cases} \dfrac{d}{d\sigma}\underset{(0)}{A}=\underset{(1)}{A}, \\ \dfrac{d}{d\sigma}\underset{(1)}{A}=\lambda\underset{(0)}{A}+\underset{(2)}{A}, \\ \dfrac{d}{d\sigma}\underset{(2)}{A}=\lambda\underset{(1)}{A}+\underset{(3)}{A}, \\ \dfrac{d}{d\sigma}\underset{(3)}{A}=\underset{(0)}{A}+\overset{4}{\lambda}\underset{(4)}{A}, \\ \dfrac{d}{d\sigma}\underset{(4)}{A}=-\overset{4}{\lambda}\underset{(3)}{A}+\overset{5}{\lambda}\underset{(5)}{A}, \\ \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots \\ \dfrac{d}{d\sigma}\underset{(\infty)}{A}=-\overset{\infty}{\lambda}\underset{(n)}{A}, \end{cases}$$

for the curves in the conformally connected manifold, and have shown that the curve for which $\lambda=\overset{4}{\lambda}=\cdots=\overset{n}{\lambda}=0$ is a generalized loxodrome which cuts all the circles passing through two fixed points always by the fixed angle $\frac{\pi}{4}$, and the curves for which $\lambda=\text{const.}$ and $\overset{4}{\lambda}=\cdots=\overset{\infty}{\lambda}=0$ are the generalized loxodromes which cuts all such circles by the fixed angle $\frac{\pi}{4}-\frac{\varphi}{2}$, where $\lambda=\tan\varphi$.

In the present paper, we shall deal with the curves for which $\overset{4}{\lambda}=\cdots=\overset{\infty}{\lambda}=0$, λ being in general the function of the conformal arc length σ. In this case, if we develop our curve on the tangent conformal space at a point of the curve, its development will be on a two-dimensional sphere, thus, we can treat the curve as if it were in a two-dimensional flat conformal space.

The main theorem which we propose to prove in this paper is the following:

Theorem: If we take a circle which cuts the curve by a certain

---

1) K. Yano and Y. Mutô: On the conformal arc length, Proc. **17** (1941), 318–322, On the generalized loxodromes in the conformally connected manifold, Proc. **17** (1941), 455–460.