$$x_0^2 = u^2, \qquad x_n^2 = u^2, \qquad\qquad 0 \leqq u^2 \leqq 1,$$

$$x_0^3 = 0, \qquad x_n^3 = \frac{1}{n} + \frac{\sin n^4 u^1}{n^3}.$$

Then we have

$$\begin{aligned} \liminf_n \iint_{B_n} f(x_n, X_n) du &= \liminf_n \int_0^\pi \int_0^1 \left| 1 - \cos^2 n^4 u^1 \right| du^2 du^1 \\ &= \frac{\pi}{2} < \pi = \int_0^\pi \int_0^1 du^2 du^1 \\ &= \iint_{B_0} f(x_0, X_0) du. \end{aligned}$$

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A NON-INVOLUTORIAL SPACE TRANSFORMATION ASSOCIATED WITH A $Q_{1,n}$ CONGRUENCE

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1. Introduction. The involutorial transformation associated with the congruence of lines meeting a curve of order m and an $(m-1)$-fold secant has been studied by DePaolis,[1] and Vogt[2] has studied the non-involutorial transformations for a linear congruence and bundle of lines. Cunningham[3] has recently studied some non-involutorial transformations associated with a $Q_{1,2}$ congruence. In the present paper a non-involutorial transformation associated with the congruence of lines on a plane curve of order n having an $(n-1)$-point and a secant through that point is considered. The bundle of lines through the multiple point is not considered as belonging to the congruence. The tangents to the curve at the point are considered to be distinct.

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[1] DePaolis, *Alcuni particolari transformazioni involutori dello spazio*, Rendiconti dell'Academia dei Lincei, Rome, (4), vol. 1 (1885), pp. 735–742, 745–758.

[2] Vogt, *Zentrale und windschiefe Raum-Verwandtschaften*, Jahresbericht der Schlesischen Gesellschaft für Vaterlandische Kultur, class 84, 1906, pp. 8–16.

[3] Cunningham, *Non-involutorial space transformations associated with a $Q_{1,2}$ congruence*, this Bulletin, vol. 47 (1941), pp. 309–312.