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Ben T Nohara* (drben@tcu.ac.jp), 1-28-1 Tamatsutsumi, Setagaya-ku, Tokyo, 1580001, Japan,
and **Akio Arimoto**. *Some considerations of Poncelet's porism using elliptic functions.*

This study concerns with Poncelet's porism in a circle and an ellipse as well as two circles. First the well known Steiner's relation for a bicentric pentagon which is inscribed and circumscribed in two circles simultaneously had been induced by the projective geometry so far but we develop the same relation analytically using Jacobi elliptic functions. Secondary we obtain the necessary and sufficient condition for a n -gon which is bicentric in a circle and an ellipse as well as two circles. Then we have the relations of the parameters of a circle and an ellipse for n -gons ($n \leq 7$). We prove that these relations are the necessary and sufficient conditions for the bicentric n -gons.

Also we study the "extended" porism in addition to the "normal" or "conventional" porism. The conventional porism means that a n -gon is created by making a round of a circle(or ellipse) from any starting point on the outside conic. The "extended" porism denotes that a n -gon is created by making multiple rounds of a circle(or ellipse). We show the fact that there exist the extended porisms in $n \geq 5$ and the relations of the parameters of conics are presented. (Received October 08, 2011)