PROJECTIVE DESCRIPTION OF SOME PLANE SEXTIC CURVES DERIVED FROM CONICS AS BASE CURVES

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Introduction. Comparatively few of the plane sextic curves are known. None of the papers written about them gives a complete treatment or a classification of these curves. The sextics appear more or less isolated in the different treatises. Apparently the methods employed produce only a very limited number of sextics.

The projective method of deriving higher plane curves described by Dr. H. P. Pettit in his *Projective description of some higher plane curves*[1] allows a more systematical study of sextics and especially a direct construction point by point.

It is the purpose of this paper to give a projective description of some of the sextics that can be derived by this method, if conics are the base curves. The number of types of these curves which could be generated by this method is here limited to 354 by giving the triangle of reference special positions with respect to the base conics.

Discussion of the general curve derived from conics as base curves. The method described by Dr. Pettit in his *Projective description of some higher plane curves* is as follows:

Let there be given two curves, C_1 of order n and C_2 of order m, two projective pencils A_1, A_3 and one connecting pencil A_2 in the plane. Any line on A_1 cuts C_1 in n points and the n lines joining these points to A_2 cut C_2 in mn points, which determine mn lines on A_3 cutting the line on A_1 in points of the generated curve.

For the present purpose let A_1, A_2, A_3 be the vertices of the triangle of reference and let the equation of the pencil on A_1 be

$$x_2 - \lambda x_3 = 0, \tag{1}$$

that of the pencil on A_2 be

$$x_1 - \mu x_3 = 0, \tag{2}$$

and that of the pencil on A_3 be

$$x_1 - \nu x_2 = 0. \tag{3}$$

Let the equations of the base conics be

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[1] Dr. H. P. Pettit, *Projective description of some higher plane curves*, Tôhoku Math. J. vol. 28 (1927–1928) pp. 72–79.