Among the orbits produced by a central force varying as the nth power of the radius vector are included the isogonal trajectories of the curves

(13) $$y' = -\tan \tfrac{1}{2}(n+1)\theta.$$

This construction yields in the case $n = -2$ (Newtonian law) parabolas with focus at the origin; in the case $n = 1$ (elastic law) equilateral hyperbolas with center at the origin; in the case $n = -5$ the circles through the origin; and in the case $n = -3$ equiangular spirals with pole at the origin.

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ON THE EQUATIONS OF QUARTIC SURFACES IN TERMS OF QUADRATIC FORMS.

BY DR. C. H. SISAM.

(Read before the American Mathematical Society, September 5, 1907.)

THE quartic surfaces whose equations are of the form

$$\phi_2(A, B, C, D) = 0,$$

where ϕ_2, A, B, C and D are quaternary quadratic forms, were the subject of a paper by H. Durrande in the *Nouvelles Annales.** By counting the number of constants involved, Durrande concluded that the most general quartic surface could be represented by an equation of the above form. He recognized, however, that his reasoning was not rigorous.

It will here be shown that the coefficients of the quartic surface determined by this equation are not independent, but are subject to a single condition. It will also be shown that *the equation of a general quartic surface can be written in the form*

$$\theta_2(A, B, C, D, E) = 0,$$

where θ_2 is a quinary quadratic form.

Let $\phi_2 = 0$ be reduced to the form

(1) $$A^2 + B^2 + C^2 + D^2 = 0,$$

where

$$A \equiv \Sigma a_{ij} x_i x_j \qquad (i \leqq j \leqq 4)$$

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* Durrande, *Nouvelles Annales*, ser. 2, vol. 9, p. 410.