$$x = \frac{1}{2}\left\{3d_j + \sqrt{4t_j - 3d_j^2}\right\}, \qquad y = \frac{1}{2}\left\{3d_j - \sqrt{4t_j - 3d_j^2}\right\}.$$

Numerous devices for shortening the computations are suggested by numerical work, whether or not the prime factor resolution of n be feasible.

As an immediate consequence of (2) we note that 9 is the only prime multiple of 9 which is the sum of two cubes > 0; from (3) the only solution $x > 0$, $y > 0$ of $x^3 + y^3 = p^2$, p prime, is $(x, y, p) = (1, 2, 3)$, etc. It is not difficult to obtain from (1)—(3) the known types of impossible equations $x^3 \pm y^3 = n$, except when n is a cube, and some others that do not seem to have been stated.

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CONTACT CURVES OF THE RATIONAL PLANE CUBIC*

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1. *Introduction.* Contact conics and hyperosculating curves of the rational cubic have been discussed by Winger.† Likewise some account has been given of curves of order n which cut the cubic, rational or elliptic, in $(3n-1)$ coincident points.‡ There remains the question of contact curves of order $n\,(n > 2)$ whose contacts are of lower orders. This paper considers that question for the rational cubic, with results which hold for $n \geqq 1$ and for contacts of any order.

If the cubic is taken in the canonical form

(1) $\qquad x_1 = 3t^2, \qquad x_2 = 3t, \qquad x_3 = t^3 + 1,$

a necessary and sufficient condition that a set of $3n$

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† *Involutions on the rational cubic,* this BULLETIN, vol. 25 (1918), p. 27.

‡ Winger, *Some generalizations of the satellite theory*, this BULLETIN, vol. 26 (1919), p. 75.