(8.1) $$a,\ b,\ c_r(a,b),\ \bar{c}_s(a,b)$$

is not a P-set for any r and s. The difficulty in proving this is that, if one is to use the method of Birch, one first needs a pair r,s for which $c_r\bar{c}_s + 1$ is a square. One might at least prove that there isat most one pair r and s such that (8.1) is a P-set.

For a and b quadratic functions of x, the basic difficulty is that $g_{k,r}$ could be a square in $Z[x]$ without being a square over $Z[a,b]$. Even if that were surmounted, adapting Theorem 6 to quadratics would present some difficulties.

For a and b integers, this paper does not add much to present knowledge except to place the problem in a larger setting. The Davenport-Baker result shows that in Theroem 9 when $a = 1$, $b = 3$, the intersection of $\mathcal{J}_1$ and $\mathcal{J}_2$ is $c_2(1,3) = 120$. A really significant result would be a proof that this is true for a and b any two successive Fibonacci numbers of even index. To show this independently from their result would present all the difficulties they encountered for their special case. At one time I hoped that one might by using the sequence of transformations (3.3) and a proof of "infinite descent" reduce the general result to that of the pair $a = 1$, $b = 3$, but it does not seem to work.

A somewhat weaker result would be the conjecture that if a, b, c are three successive even-indexed Fibonacci numbers and if a, b, c, d is a P-set of four numbers, then d cannot be a Fibonacci number. From Theorem 10, $c_2(a,b)$ is not a Fibonacci number. Unfortunately, for $c_k(a,b)$ with $k > 2$ there does not seem to be such a definite inequality as (7.4). One possible approach could be to consider the set of Fibonacci numbers as dividing the line of positive reals into intervals. Perhaps one could, using Theorem 9, assume, for example, that $c_r(a,b)$ and $c_s(b,e)$ were in the same interval and thus get a relationship between r and s which might be fruitful. But this seems like a long hard row to hoe. Also it would be interesting to show that a, b, c as defined above are not in a P-set of five elements. All of these results seem very plausible.

REFERENCE

1. V. E. Hoggatt, Jr., and G. E. Bergum, "A Problem of Fermat and the Fibonacci Sequence," *The Fibonacci Quarterly*, Vol. 15, No. 4 (Dec. 1977), pp. 323–330.

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[Continued from page 154.]

B. We can easily obtain

$$\binom{2p}{p}p = 2(2p-1)\binom{2p-2}{p-1} \quad \text{and from Part A,} \quad \binom{2p}{p} \equiv 2 \pmod{p^3}.$$

Thus $2p \equiv 2(2p-1)\binom{2p-2}{p-1} \pmod{p^3}$. Since $(2, p^3) = (2p-1, p^3) = 1, 2$, and $2p-1$ we have the multiplicative inverses $(\text{mod } p^3)$ and we get $p/(2p-1) \equiv \binom{2p-2}{p-1} \pmod{p^3}$. Now $(2p-1)^{-1} \equiv -1-2p-4p^2 \pmod{p^3}$. Hence

$$p/(2p-1) \equiv p(-1-2p-4p^2) \pmod{p^3} \equiv -p-2p^2 \pmod{p^3}.$$

The result then follows.

AN ADJUSTED PASCAL

H-213 Proposed by V. E. Hoggatt, Jr., San Jose State University, San Jose, California.

A. Let A_n be the left adjusted Pascal triangle, with n rows and columns and 0's above the main daigonal. Thus

$$A_n = \begin{pmatrix} 1 & 0 & & & \cdots & 0 \\ 1 & 1 & 0 & & \cdots & 0 \\ 1 & 2 & 1 & 0 & \cdot & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & \cdots \end{pmatrix}_{n\times n}$$

Find $A_n \cdot A_n^T$ where A_n^T represents the transpose of matrix, A_n.

B. Let

$$C_n = \begin{pmatrix} 1 & 0 & 0 & & & \cdots & 0 \\ 0 & 1 & 0 & & & \cdots & 0 \\ 0 & 1 & 1 & 0 & & \cdots & 0 \\ 0 & 0 & 2 & 1 & 0 & \cdot & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & \cdots & \cdots \end{pmatrix}_{n\times n}$$