$$H_n = F_n, \quad \text{where} \quad \left\{ \begin{matrix} n \\ r \end{matrix} \right\} = \left[\begin{matrix} n \\ r \end{matrix} \right].$$

Also solved by L. Carlitz, T. J. Cullen, Herta T. Freitag, John E. Homer, Jr., Peter A. Lindstrom, John W. Milsom, C. B. A. Peck, Klaus-Günther Recke, A. G. Shannon, Charles W. Trigg, Gregory Wulczyn, Michael Yoder, and the Proposer.

FOURTH POWERS IN TERMS OF FIBONOMIALS

B-177 Proposed by Phil Mana, University of New Mexico, Albuquerque, New Mexico.

Using the notation of B-176, show that

$$F_n^4 = \left[\begin{matrix} n+3 \\ 4 \end{matrix} \right] - a\left[\begin{matrix} n+2 \\ 4 \end{matrix} \right] - a\left[\begin{matrix} n+1 \\ 4 \end{matrix} \right] + \left[\begin{matrix} n \\ 4 \end{matrix} \right],$$

for some integer a and find a.

Solution by R. M. Grassl, University of New Mexico, Albuquerque, New Mexico.

Letting $n = 2$, we find that a would have to be 4. Then letting $a = 4$, both sides satisfy the same fourth-order (i.e., five-term) recurrence relation. Hence it suffices to verify the formula for $n = 0, 1, 2, 3$ and it follows for all values of n by induction.

Also solved by L. Carlitz, T. J. Cullen, Herta T. Freitag, John E. Homer, Jr., C. B. A. Peck, Klaus-Günther Recke, Charles W. Trigg, Gregory Wulczyn, Michael Yoder, David Zeitlin, and the Proposer.

[Continued from p. 438.]

It is found, also, that the slope m of the distances z_n versus the Fibonacci Series f_n for each planet system is a power law function of the mass M and radius R of the planet in the form

$$m \propto M^3 R^{-7}.$$