

$$H'_{n+1} = \sum_{k=0}^n H_k 2^{n-k} = H_n + 2H'_n = 2^{n+1}H_2 - 2H_{n+2} + H_n = 2^{n+1}H_2 - H_{n+3}.$$

Thus (A) holds for all $n \geq 1$. To obtain the identities given by Carlitz, we note that $F_2 = 1$, $L_2 = 3$.

Also solved by Herta T. Freitag, D. V. Jaiswal (India), Bruce W. King, C.B.A. Peck, A. C. Shannon (Australia), David Zeitlin, and the proposer.

ERRATA

Please make the following correction in the October Elementary Problems and Solutions: In the third equation from the bottom, on p. 292, delete

$$\frac{F_{2k}}{F_{2k+2}} < \frac{F_{2k}}{F_{2k+1}} < \frac{F_{2k+1}}{F_{2k}} < \frac{F_{2k-1}}{F_{2k}}$$

and add, instead,

$$\frac{F_{2k}}{F_{2k+2}} < \frac{F_{2k+2}}{F_{2k+3}} < \frac{F_{2k+1}}{F_{2k+2}} < \frac{F_{2k-1}}{F_{2k}}$$

[Continued from p. 334.]

Hence, by (13), $p \nmid D_{2n}^2$

In each case we have found a reduced arithmetic progression no prime member of which is a factor of a certain D_{2n}^2 . Hence, by Lemma 1, II), there is an infinitude of composite D_{2n+1}^2 .

REFERENCES

1. R. D. Carmichael, "On the Numerical Factors of the Arithmetic Forms $\alpha^n \pm \beta^n$," Annals of Mathematics, 15 (1913-1914), pp. 30-70.
2. W. J. LeVeque, Topics in Number Theory, I (1958).
