(2) The theory for composite moduli.

(3) Similar summations for other Fibonacci sequences than F_i.

(4) Possibly by means of additional computer data, the study of cases in which summations are congruent to zero when they need not be; patterns and generalizations in these instances.

LETTER TO THE EDITOR

TWIN PRIMES

Charles Ziegenfus, Madison College, Harrisonburg, Va.

If p and $p + 2$ are (twin) primes, then $p + (p + 2)$ is divisible by 12, where $p > 3$.

Two proofs:

If $p > 3$, then p must be of the form

$$6k + 5 \text{ or } 6k + 1 .$$

If

$$p_{n+1} = p_n + 2 ,$$

then p_n must be of the form $6k + 5$. For otherwise

$$p_{n+1} = (6k + 1) + 2 = 3(2k + 1)$$

and is not prime. Therefore,

$$p_n + p_{n+1} = (6k + 5) + (6k + 5) + 2 = 12(k + 1) .$$

p_n must be of the form $3k$, $3k + 1$, or $3k + 2$. Clearly $p_n = 3k$ since p_n is assumed greater than 3.

If $p_n = 3k + 1$, then $p_{n+1} = 3k + 1 + 2 = 3(k + 1)$ and is not prime. Clearly, $p_n + p_{n+1}$ is divisible by 4.

Now $p_n + p_{n+1} = (3k + 3) + (3k + 2) + 2 = 3(2k + 2)$.

So $p_n + p_{n+1}$ is divisible by 12.