Hence infinite $F$-sequences can only exist in simple fields. However, the converse does not hold; there are simple fields that do not contain infinite $F$-sequences (see [3], [4]).

Proof of Theorem 2. It is well-known that the class number of $K$ equals the number of equivalence-classes among the ideals of norm not exceeding $O_K(\sqrt{d})$. Hence it is enough to show that every ideal $m$, with norm $m$ not exceeding $[O_K(e\sqrt{d})]$ is principal if $m(e) > O_K(e\sqrt{d})$. Suppose that $m(e) > [O_K(e\sqrt{d})]$ i.e. since $[O_K(e\sqrt{d})] > m$ and every initial segment of an $F$-sequence is an $F$-sequence there is an $F$-sequence, say $\langle a_1, a_2, \ldots, a_{m+1}\rangle$, of length $m+1$. By the definition of $F$-sequences there exists one $a_i \neq a_{m+1}$ such that $a_i = a_{m+1} \pmod m$. Hence $(a_i - a_{m+1}) = m \cdot h$ and

$$|N(a_i - a_{m+1})| = N(m) \cdot N(h) = m \cdot N(h) < \max(i, m+1) = m+1$$

by Theorem 1 and so $h = 1$ and $(a_i - a_{m+1}) = m \cdot (1) = m$.

This completes the proof.

References


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 ACTA ARITHMETICA

XXIX (1976)

Corrections to the paper “Quasiperfect numbers”


by

H. L. Abbott (Edmonton, Alberta), C. E. Aull, Ezra Brown (Blacksburg, Virg.) and D. Suryanarayana (Waltair, India)

1. Replace lines 21-24 on page 443 namely “Thus if $3^5 17^2 q^2 \ldots$ and $N$ would not be $Q$P” by the following:
   Thus if $N = 3^5 17^2 q^2 \ldots$ is $Q$P, both $q$ and $r$ must be greater than 120. For, if $q < 120$, then

   $$\frac{\sigma(Mq^2)}{Mq^2} > \frac{\sigma(M)}{M} \left(1 + \frac{1}{q}\right) > 2$$

   and so by Proposition 0, no non-trivial multiple of $Mq^2$ can be a $Q$P; so that $N$ cannot be a $Q$P.

2. Replace the penultimate sentence on page 443 “But $\sigma(239^2) = 0 \pmod{29}$” disallowed by Proposition 0" by the following:

   If $N = 3^5 17^2 239^2 r$, then $2 < \frac{\sigma(M)}{M} \cdot \frac{239}{238} \cdot \frac{r}{r-1}$; which gives

   $$1 - \frac{1}{r} < \frac{173398815623}{174109437500},$$

   from which it follows that $r < 247$. Since $r$ is a prime, $r = 241$. This cannot hold, since the exponent on 241 must be at least 4, by Lemma 4A(f).

3. Replace $p^k$ in line 1 on page 444 by $17^a$.

4. Replace “$\sigma(N) = 2 \pmod{3}$”, in line 16 on page 444 by “$\sigma(N) = 0$ or $2 \pmod{3}$, which cannot hold, since $\sigma(N) = 2 N + 1 \equiv 1 \pmod{3}$”.

5. Replace “$\sigma(N) = 2 \pmod{3}$” in line 9 on page 445 by “$\sigma(N) = 0$ or $2 \pmod{3}$, which cannot hold, since $\sigma(N) = 2 N + 1 \equiv 1 \pmod{3}$”.

- Acta Arithmetica XXIX.4
6. Replace “pseudoperfect numbers” in line 17 on page 447 by “almost-perfect numbers” (for definition of these numbers, we refer to the paper entitled “Perfect transfinite numbers” by P. Zvongrowski published in Fundamenta Mathematicae 52 (1963), pp. 123–128).

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