Zbl 013.10402

Erdős, Paul

The representation of an integer as the sum of the square of a prime and of a square-free integer. (In English)

J. London Math. Soc. 10, 243-245 (1935).

The author proves the theorem that, if n is a sufficiently large integer, then primes p and quadratfrei integers f exist such that $n = p^2 + f$ when $n \not\equiv 1 \pmod 4$ and $n = 4p^2 + f$ when $n \equiv 1 \pmod 4$. The proof involves the prime-number theorem. The author states that he can prove similarly the theorem that $n = p^k + q$, where k is a given exponent and g has no k-th power as divisor. Presumably for certain values of k there is an exceptional case corresponding to $n \equiv 1 \pmod 4$ when $k = 2$, but this is not stated; for example, if $k = 4$ and $n \equiv 1$ (mod 1)6, $n = p^k + g$ is not possible unless $p = 2$ and $n - 16$ is k-th power free.

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Classification:
11P32 Additive questions involving primes
11N25 Distribution of integers with specified multiplicative constraints