The author proves (by Brun's method) that, for an infinity of n, the number of solutions of the equation $n = p^2 + q^2$ in primes p and q is greater than $\exp\left(\frac{c \log n}{\log \log n}\right)$. This is an improvement of the author's previous result (see Zbl 016.20103). The author also proves the theorem: Let $r_1 < r_2 < \cdots$ be an infinite sequence of positive integers such that for an infinity of N the number of r's less than or equal to N is greater than $N \exp\left(-\frac{c_4 \log N}{\log \log N}\right)$ with $c_4 < \frac{1}{2} \log 2$. Then for an infinity of M the number of the solutions of the equation $r_j^2 - r_i^2 = M$ is greater than $\exp\left(\frac{c_2 \log M}{\log \log M}\right)$, where c_5 depends only upon c_4.

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