(iv) The series $\sum_{-\infty}^{\infty} a_n(1-xe^{2\pi i a n})^{-1}$, where $|x|<1$ and a are real, obviously converges if $\sum |a_n|$ converges. Can one give a less stringent condition? See [194].

(v) A non-homogeneous cubic congruence $f(x, y, z) \equiv 0 \pmod{p}$ has $p^2+O(p)$ solutions, apart from certain exceptions. (This has been substantially proved by Davenport and Lewis, using a result of Dwork; see Quart. J. of Math. (2), 14 (1963), 154-159.)

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ACTA ARITHMETICA
IX (1964)

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ACTA ARITHMETICA
IX (1964)

Further developments in the comparative prime-number theory I

by

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1. In a report dated from June 19, 1871, which was written to support the designation of Chebyshev as foreign member of the Academy in Berlin and signed among others by Kronecker, Kummer, and Weierstrass, one reads the following passage (see [1]).

"...Endlich ist Herr Tschebychew der erste Mathematiker, welcher für die Anzahl der Primzahlen bis zu einer hohen Grenze den Ueberschuss der Primzahlen der Form $4n+3$ über diejenigen von der Form $4n+1$ constatiert und für den asymptotischen Ausdruck $\sqrt{x}/\log x$ angegeben hat."

What was behind these lines? Chebyshev wrote in a letter in 1853, i.e. a few years after Dirichlet proved that for $(k, l_1) = (k, l_2) = 1$ in a weak sense the number of primes $\equiv l_1 (\operatorname{mod} k)$ is asymptotically equal to that of the primes $\equiv l_2 (\operatorname{mod} k)$, that he is in possession of a theorem which can be popularly expressed so that there are more primes of the form $4n+3$ than of $4n+1$. He meant by that (according to his letter, which is printed in [2]) that

$$\lim_{x\to+0} \sum_{p>2} (-1)^{(p-1)/2} e^{-px} = -\infty \tag{1.1}$$

(p denoting always primes) and stated also the existence of a sequence

$$x_1 < x_2 < \ldots \to \infty$$

such that for $\nu \to \infty$

$$\frac{\pi(x_\nu, 4, 3) - \pi(x_\nu, 4, 1)}{(\sqrt{x_\nu}/\log x_\nu)} \to 1. \tag{1.2}$$

(Here and later $\pi(x, k, l)$ stands for the number of primes not exceeding x which are $\equiv l \operatorname{mod} k$, $(k, l) = 1$, $c_1, c_2, \ldots$ positive, explicitly calculable constants.) Most probably in Germany nobody read the original