The Rabinowitsch-Mollin-Williams theorem revisited. (English summary)


This paper is devoted to the classification of Rabinowitsch polynomials \( (x^2 + x - \Delta + 1)/4 \) [ cf. D. Byeon and H. M. Stark, J. Number Theory 99 (2003), no. 1, 219–221; MR1957253 (2003m:11176)]. The author considers the relevant case \( \Delta \equiv 1 \pmod{4} \). In an updated Rabinowitsch–Mollin–Williams theorem there are established necessary and sufficient conditions having \( |x^2 + x - m| \) to be 1 or a prime for all \( x \in [1, \sqrt{m}] \), \( m \neq 2 \). This follows from appropriate results. For example it is proved that one has \( \Delta = n^2 - 4 \) for some \( n \in \mathbb{N} \), \( h_\Delta = 1 \) only for \( \Delta \in \{5, 21, 77, 437\} \). The author gives appropriate lists for Rabinowitsch polynomials.

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