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SYSTEMS OF EXPONENTIAL CONGRUENCES (ABSTRACT)

ANDRZEJ SCHINZEL, Warszawa

The following theorem has been presented with the proof to appear soon in Demonstratio Mathematica.

Let K be an algebraic number field, α_{ij}, $\beta_i \in K^*(1 \leqq i \leqq h,\ 1 \leqq j \leqq k)$. Assume that the numbers $\alpha_{1j}(1 \leqq j \leqq k)$ are multiplicatively independent, i.e.

$$\prod_{j=1}^{k} \alpha_{1j}^{x_j} = 1 \quad \text{implies} \quad x_1 = x_2 = \ldots = x_k = 0.$$

If the system of congruences

$$\prod_{j=1}^{k} \alpha_{ij}^{x_j} \equiv \beta_i \pmod{\mathfrak{P}} \quad (1 \leqq i \leqq h)$$

is soluble for almost all prime ideals $\mathfrak{P}$ of K, then the corresponding system of equations

$$\prod_{j=1}^{k} \alpha_{ij}^{x_j} = \beta_i \qquad (1 \leqq i \leqq h)$$

is soluble in integers. For $k = 1$ but not for $k \geqq 2$ the condition of multiplicative independence of α_{1j} can be omitted.

The author has proved earlier (Acta Arithmetica 27) that for $h = 1$ the above implication holds without any condition on α_{ij} and L. Somer has proved that for $k = 1$ the implication holds provided either none or all of the numbers are roots of unity. The latter result presented at the meeting at Patras in 1984 has motivated the study of the systems of exponential congruences for prime moduli. Systems of exponential congruences for composite moduli have been studied by the author in Acta Arithmetica 32 and 36.

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SÚHRN

SYSTÉMY EXPONENCIÁLNYCH KONGUENCIÍ

A. Schnizel, Varšava

V práci je uvedené znenie vety udávajúcej kedy z riešiteľnosti exponenciálnych kongruencií vyplýva riešiteľnosť v celých číslach. Celý dôkaz vety bude uvedený v Demonstratio Mathematica.

РЕЗЮМЕ

СИСТЕМЫ ПОКАЗАТЕЛЬНЫХ СРАВНЕНИЙ

А. Шинцель, Варшава

В работе сформулирована теорема, которая установливает, когда из разрешимости системы показательных сравнений следует разрешимость в целых числах. Полное доказательство теоремы будет опубликовано в Demonstratio Mathematica.