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HIGH LEVEL COMPARISON - A METHOD OF DETERMINING THE CLASS OF THE DECISION

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ABSTRACT

This article covers complex modules

$$f(x) \equiv 0\left(mod\ p_1{}^{\alpha_1}\ p_2{}^{\alpha_2} \dots p_k^{\alpha_k}\right)$$

comparisons are output to the comparison system, and the solutions of each comparison of the system are determined using the product.

KEYWORDS. Comparison, system of comparisons, product, remainder.

We have a complex module, $f(x) \equiv 0\left(mod\ p_1{}^{\alpha_1}\ p_2{}^{\alpha_2} \dots p_k^{\alpha_k}\right)$ (1)give a comparison. Here are $p_1, p_2, \dots, p_k$different prime numbers,$(P_i, P_j) = 1 \quad i \neq j,\ i = \overline{1,k},\ j = \overline{1,k}$.

(1) Comparisons should be required to define a class of solutions. Usually given

(1) is equivalent to the following system of comparison:

$$\begin{cases} f(x) \equiv 0(mod\ P_1{}^{\alpha_1}) \\ f(x) \equiv 0(mod\ P_2{}^{\alpha_2}) \\ \dots \\ f(x) \equiv 0(mod\ P_k{}^{\alpha_k}) \end{cases} \quad (2)$$

(2) the relationship is reasonable that is, comparison of property come turns out to be .[1], [2]

Seconds on the other hand , in general , when a high degree of comparison dice universal formula , solving is not . Therefore, the possibility of boric General without $f(x) \equiv 0(modP^{\alpha})$ (3)solving the training class let's find out. This method is originally $f(x) \equiv 0(modP)$ (4).

Here _$f(x) = a_0x^n + a_1x^{n-1} + \cdots + a_n$ (5)

If n > p in (5) , this comparison level (p-1) can be reduced.$f(x) = (x^p - x)Q(x) + R(x)$ (6)

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Given the spot $R(x) \equiv 0(modP^{\alpha})$ $(5)'$in (6) , the comparison in (5) can be written as follows:$(x^p - x) \vdots p$

(5) neither initially module P on the classroom solutions let's learn .

Assumption Let (5) — has a solution and should _ get:

$$x \equiv x_1(modP) \ \rightarrow x = x_1 + Pt_1 \quad (7)$$

(7) c (5) ha put her _ decision P^2module on let's find out

$f(x_1) + Pf'(x_1)t \equiv 0(modP^2)$ $f(x_1) \vdots P$Considering

$$\frac{f(x_1)}{P} + f'(x_1)t_1 \equiv 0(modP) \quad (8)$$

(8) to the decision has _ If $(f'(x_1), P) = 1$so. $x = x_1 + Pt_1$with the value of R (x) Taylor in a row distribute P^2ha caralla hadlar leave will be sent .

The last condition from the solution (8) to the solution has as well as this solution class as follows to obtain :

$$t_1 \equiv t_1'(modP) \rightarrow x = x_1 + P(t_1' + P^2 t_2) = x_2 + P^2 t_2$$

$$x_2 = x_1 + Pt_1' \quad (9)$$

(9) neither (5) ha put the comparison P^3module on the solutions class we learn and the yield that was ifodada P^3can be written as follows:$f(x_2) + f'(x_2)P^2 t_2 \equiv 0(modP^3)$

$\frac{f(x_2)}{P^2} + f'(x_2)t_2 \equiv 0(modP)$it's here too ($f'(x_2), P) = 1$given that the final solution for the comparison above can be written as follows$t_2 \equiv t_2' + Pt_3$ (10)

(10) neither (9) ha let's put $x = x_2 + P^2(t_2' + Pt_3) = x_2 + P^2 t_2' + P^3 t_3$Repeating this process $(\alpha - 2)$, the class of general solutions can be written as follows:$x = x_{\alpha} + P^{\alpha} t_{\alpha}$

The above listed method is the following condition reasonable that again while carra emphasizing let's go _$(f'(x_k, P^k) = 1, \quad k = \overline{1,\alpha}$

The article $f(x) \equiv 0\left(mod\ p_1^{\alpha_1}\ p_2^{\alpha_2} \ldots p_k^{\alpha_k}\right)$apparently high level comparison to solve the training class comparison to the citation system $f(x) \equiv 0\left(modP_i^{\alpha_i}\right) \quad i = \overline{1,k}$then discusses the considerations for solving the decision class of each system of comparisons using the product, and the corresponding

$f(x) \equiv 7x^3 + 19x + 25 \equiv 0(mod27)$comparison decision class

$x \equiv 13(mod27); \quad x = 13 + 27t_3$found.

For example .$f(x) \equiv 0(mod3^3)$ (11) $f(x) = 7x^3 + 19x + 25$

$f(x) \equiv 7x^3 + 19x + 25 \equiv x^3 + x + 1 \equiv 0(mod3)$,$(x^3 - x) + 2x + 1 \equiv 0(mod3)$

$(x^3 - x) \vdots 3 \rightarrow 2x \equiv -1(mod3),\ 2x \equiv 2(mod3),\ \ x \equiv 1(mod3)\ \ \ x = 1 + 3t_1$ (12)

(12) to (11) release _ 3^2Ha divisible limits leave send

$$f'(x_1) = (28x^3 + 19)x \equiv 47,\ \ f(1) = 51, f(1) + f'(1)3t_1 \equiv 0(mod3^2),$$

$$51 + 3 \cdot 47t_1 \equiv 0(mod3^2), 17 + 47t_1 \equiv 0(mod3),\ -2 + 2t_1 \equiv 0(mod3),$$

$$t_1 \equiv 1(mod3), t_1 = 1 + 3t_2 \qquad (13)$$

(13) to (12) let's put$x = 1 + 3(1 + 3t_2) = 4 + 3^2t_2$ (14) $x_2 = 4$

$$f(4) = 7 \cdot 4^3 + 19 \cdot 4 + 25 = 7 \cdot 64 + 76 + 25 = 549$$

$f'(x) = 21x^2 + 19, f'(4) = 21 \cdot 4 + 19 = 84 + 19 = 103, 549 + 103 \cdot 3^2t_2 \equiv 0(mod27)$

$$61 + 103t_2 \equiv 0(mod3),\ 1 + t_2 \equiv 0(mod3), t_2 \equiv 2 + 3t_3 \qquad (15)$$

(15) to (14) put the last _ $x = 4 + 3^2(2 + 3t_3) = 13 + 3^3t_3$.

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