

Меню 0362 Вар 22
(2, 6, 7 Задачи - 21 Вар)

1) $\left\{ \begin{array}{l} x = 115 + 123u, \\ y = -245 - 262u, \end{array} \right. u \in \mathbb{Z}$
2 [19; 1, 6, 1, 38]

3

4

5 $P(x) = -x^4 - 4x^3 - 2x^2 + 4x + 1$

6 Реш. квадрат. ур.

7 $23_{10} = 43_5$

8 73

9 $[2; 3; 1; 2; 5; 2]$

10 $4x^3 + 2x$

$\text{Baz}\sim 1$
 $\text{Baz RR} (8.2, 6, 7 \rightarrow \frac{\text{Baz}}{2})$

$$1) 3406x + 1599y = -65$$

$$\text{HOD}(3406, 1599) = 13$$

$$3406 = 1599 \cdot 2 + 208$$

$$1599 = 208 \cdot 7 + 143$$

$$208 = 143 \cdot 1 + 65$$

$$143 = 65 \cdot 2 + 13$$

$$65 = 13 \cdot 5$$

Basislösung der HOD:

$$262x + 123y = -5$$

Permutationspair

$$262x_0 + 123y_0 = 1$$

$$262 = 123 \cdot 2 + 16$$

$$123 = 16 \cdot 7 + 11$$

$$16 = 11 \cdot 1 + 5$$

$$11 = 5 \cdot 2 \boxed{1}$$

$$5 = 1 \cdot 5$$

Обратные x0g Arr. Ergebnis:

$$1 = 11 - (5 \cdot 2) = 11 - (16 - 11 \cdot 1) \cdot 2 =$$

$$= 11 \cdot 3 - 16 \cdot 2 = (123 - (6 \cdot 7)) \cdot 3 - 16 \cdot 2 =$$

$$= 123 \cdot 3 - 16 \cdot 23 = 123 \cdot 3 - 23(262 - 123 \cdot 2)$$

$$= \underline{\underline{123 \cdot 49 - 262 \cdot 23}}$$

!!

$$x_0 = -23$$

$$y_0 = 49$$

Сделано проверка:

$$123 \cdot 49 - 262 \cdot 23 = 1$$

$$6027 - 6026 = 1$$

$$1 = 1$$

Тогда:

$$q_{\text{нр}} 262x + 123y = -5$$

$$x^* = x_0 \cdot \frac{c}{d} = -23 \cdot \frac{-5}{1} = 115$$

$$y^* = y_0 \cdot \frac{c}{d} = 49 \cdot \frac{-5}{1} = -245$$

$$\begin{cases} x = x^* + \frac{b}{d}k \\ y = y^* - \frac{a}{d}k \end{cases} \quad k \in \mathbb{Z}$$

$$\Leftrightarrow \begin{cases} x = 115 + 123k \\ y = -245 - 262k \end{cases} \quad k \in \mathbb{Z}$$

Более того проверяй:

$$3406(115 + 123k) + 1599(-245 - 262k) =$$

$$= -65$$

$$\begin{array}{r} \times 3406 \\ 115 \\ \hline + 17030 \\ \hline 3406 \\ \hline \end{array} \quad \begin{array}{r} 391690 \\ \hline 0 \end{array}$$

$$\begin{array}{r}
 \times 3406 \\
 \times 123 \\
 \hline
 10218 \\
 +6812 \\
 \hline
 3406 \\
 \hline
 418938
 \end{array}$$

$$\begin{array}{r}
 \times 1599 \\
 \times 245 \\
 \hline
 7995 \\
 +6396 \\
 \hline
 3188 \\
 \hline
 391755
 \end{array}$$

$$\begin{array}{r}
 \times 1598 \\
 \times 262 \\
 \hline
 3998 \\
 +9594 \\
 \hline
 3198 \\
 \hline
 418938
 \end{array}$$

$$\begin{array}{r}
 418938k \\
 391690 + \cancel{391755k} = -391755 - 418938k \\
 = -65
 \end{array}$$

OFG: $\begin{cases} X = 115 + 123k \\ Y = -295 - 262k \end{cases} \quad k \in \mathbb{Z}$.

$\sqrt{2}$

$$\begin{aligned}
 \sqrt{395} &= 19 + \sqrt{395} - 19 = \\
 &= 19 + \frac{1}{\sqrt{395} - 19} \left(\frac{\sqrt{395} + 19}{\sqrt{395} + 19} \right) =
 \end{aligned}$$

$$\begin{aligned}
 &= 19 + \frac{1}{\frac{\sqrt{395} + 19}{34}} =
 \end{aligned}$$

$$19 + \frac{1}{1 + \frac{\sqrt{395}-15}{34}} = 19 + \frac{1}{12 + \frac{1}{\frac{34}{\sqrt{395}-15} \left(\frac{\sqrt{395}+15}{\sqrt{395}-15} \right)}}$$

$$= 19 + \frac{1}{1 + \frac{1}{1 + \frac{34\sqrt{395}+510}{170}}} =$$

$$= 19 + 12 + \frac{1}{6 + \frac{\sqrt{395}-15}{5}} =$$

$$= 19 + 12 + \frac{1}{6 + \frac{1}{6 + \frac{1}{\frac{5}{\sqrt{395}-15}}}} =$$

$$= 19 + \frac{1}{12 + \frac{1}{6 + \frac{1}{\left(\frac{5}{\sqrt{395} - 15} \right) \left(\frac{\sqrt{395} + 15}{\sqrt{395} + 15} \right)}}} =$$

$$= 19 + \frac{1}{12 + \frac{1}{6 + \frac{1}{\left(\frac{5\sqrt{395} + 75}{170} \right)}}} =$$

$$= 19 + \frac{1}{9 + \frac{1}{6 + \frac{1}{1 + \frac{\sqrt{395} - 19}{39}}}} =$$

$$= 19 + \frac{1}{1 + \frac{1}{6 + \frac{1}{1 + \frac{1}{\left(\frac{34}{\sqrt{395}-19} \right)}}}} =$$

$$= 19 + \frac{1}{1 + \frac{1}{6 + \frac{1}{1 + \frac{1}{\left(\frac{34}{\sqrt{395}-19} \right) \left(\frac{\sqrt{395}+19}{\sqrt{395}+19} \right)}}}} =$$

$$= 19 + \frac{1}{1 + \frac{1}{6 + \frac{1}{1 + \frac{1}{\left(\frac{34\sqrt{395}+646}{34} \right)}}}} =$$

$$= 19 + \frac{1}{1 + \frac{1}{6 + \frac{1}{1 + \frac{1}{38 + (\sqrt{395} - 19)}}}}$$

ОТВЕТ:

$$\left[19; \overline{1, 6, 1, 38} \right]$$

№ 6

$$x^4 - 5x^3 - 6x^2 + 7x - 2$$

							Проверка
1	<u>f(5)</u>	-6	7	<u>-2</u>			
1	1	-4	-10	-3	-5		$F(1) = -5$
-1	1	-6	0	7	-9		$F(-1) = -9$
2	1	-3	-12	-17	-36		$F(2) = -36$
-2	1	-7	+8	23	16		$F(-2) = 16$

ОТВ. Поясните

N7

Pleun 88 4P-e, Barucaune 6
5-Tu pernū Cu seue Cen. uud

$$4_5 x + 121_5 = 1003_5$$

I crocos:

Reperreger 6 10-4 myo Cu erley ova

$$4_5 = 4_{10}$$

$$121_5 = 1 \cdot 25 + 2 \cdot 5 + 1 = 36_{10}$$

$$1003_5 = 1 \cdot 125 + 3 = 128$$

Pleun 4P-e Aug 2:

$$4x + 36 = 128$$

$$x = 32 - 9$$

$$\underline{x = 23}$$

недобегом в 5-мм в сс.:

$$23_{10} \rightarrow 43_5 \checkmark$$

$$\begin{array}{r} 23 \mid 5 \\ -20 \quad \textcircled{④} \\ \hline 3 \mid 5 \end{array}$$

II способ

Решим уравнение в 5-мм сс.

$$4_5 x + 121_5 = 1003_5$$

$$\begin{array}{r} 100 \quad 3_5 \\ -121 \\ \hline 332_5 \end{array}$$

$$4_5 x = 332_5$$

$$\begin{array}{r} 332_5 \mid 4_5 \\ -31 \\ \hline 22 \\ -22 \\ \hline 0 \end{array}$$

$$x = 43_5 \checkmark$$

Проверка:

$$1) 43_5 \cdot 4_5 + 121_5 = 332_5 + 121_5 =$$

$$= 1003_5 \rightarrow \text{но результат верен.}$$

2) Regelung mit 10-mm² Kabel

$$U_{10} = 23_{10} + 36 = 92 + 36 = 128 \text{ V}$$

→ unpolnt maigen Rechen:

OFB

$$X = 43_5 = 23_{10}$$

N9

$$I = \frac{293}{129} = 2 + \frac{35}{129} = 2 + \overline{1 \left(\frac{129}{35} \right)} =$$

$$= 2 + \overline{1 \left(3 + \frac{24}{35} \right)} = 2 + \overline{1 \left(3 + \frac{1}{\frac{24}{35}} \right)} =$$

$$= 2 + \overline{1 \left(3 + \frac{1}{1 + \frac{11}{24}} \right)} = 2 + \overline{1 \left(3 + \frac{1}{1 + \frac{1}{\frac{24}{24}} \left(\frac{24}{24} \right)} \right)} =$$

$$= 2 + \frac{1}{3 + \frac{1}{1 + \frac{1}{2 + \frac{1}{2}}}} = 2 + \frac{1}{3 + \frac{1}{1 + \frac{1}{2 + \frac{1}{\left(\frac{1}{2}\right)}}}}$$

$$= 2 + \frac{1}{3 + \frac{1}{1 + \frac{1}{2 + \frac{1}{5 + \frac{1}{2}}}}} = 2 + \frac{1}{3 + \frac{1}{1 + \frac{1}{2 + \frac{1}{5 + \frac{1}{\left(\frac{1}{2}\right)}}}}}$$

$$= [2; 3; 1; 2; 5; 2]$$

I. Gugod:

$$293 = 129 \cdot 2 + 35$$

$$129 = 35 \cdot 3 + 24$$

$$35 = 24 \cdot 1 + 11$$

$$24 = 11 \cdot 2 + 2$$

$$11 = 2 \cdot 5 + 1$$

~~$$2+5=7$$~~

$$2 = 1 \cdot 2$$

$$\frac{29^3}{129} = [2; 3, 1, 2, 5, 2]$$

$$\text{OFG: } \frac{29^3}{129} = [2; 3, 1, 2, 5, 2]$$

10

$$\begin{array}{r} 3x^5 + 3x^4 + 5x^3 + 5x + 6 \\ \hline 5x^3 + 6x^2 + x + 3 \end{array}$$

$$\mathbb{Z}/7\mathbb{Z}[x]$$

$$\begin{array}{r}
 3x^5 + 3x^4 + 5x^3 + 5x + 6 \\
 - 3x^5 + 5x^4 + 2x^3 + 6x^2 \\
 \hline
 - 5x^4 + 3x^3 - x^2 + 5x + 6 \\
 - 5x^4 + 6x^3 + x^2 + 3x \\
 \hline
 4x^3 + 0 + 2x
 \end{array}$$

Проверка:

$$(5x^3 + 6x^2 + x + 3)(2x^2 + x) =$$

$$= 3x^5 + 5x^4 + 2x^3 + 6x^2 + 5x^4 + 6x^3 + x^2 + 3x =$$

$$\begin{aligned}
 &= 3x^5 + 3x^4 + x^3 + 3x = (3x^5 + 3x^4 + 5x^3 + 5x + 6) - \\
 &- (4x^3 + 2x)
 \end{aligned}$$

$$\text{ОТВ. } 4x^3 + 2x$$

✓ 5

$$P(-2) = 1$$

$$P(1) = -2$$

$$P(-1) = -2$$

$$P(2) = -47$$

$$P(-4) = -47$$

$$P(x) = \frac{(x-1)(x+1)(x-2)(x+4)}{(-3)(-1)(-4)\cdot 2} \cdot 1 +$$

$$+ \frac{(x+2)(x+1)(x-2)(x+4)}{3 \cdot 2 \cdot (-1) \cdot 5} (-2) +$$

$$+ \frac{(x+2)(x-1)(x-2)(x+4)}{(1)(-2)(-3)(3)} (-2) + \frac{(x+2)(x-1)(x+1)(x+4)}{4 \cdot 1 \cdot 3 \cdot 6}$$

$$+ \frac{(x+2)(x-1)(x+1)(x-2)}{(-2)(-5)(-3)(-6)} \cdot (-47) =$$

$$= -\frac{(x^3 - 2x^2 - x + 2)(x+4)}{24} + \frac{(x^2 - 4)(x+1)(x+4)}{15}$$

$$- \frac{(x+2)(x-1)(x-2)(x+4)}{9} \frac{(x^3 - 4)(x-1)(x+4)}{9}$$

$$- \frac{(47x + 94)(x-1)(x+1)(x+4)}{72} - \frac{47(x^2 - 4) \cdot}{11}$$

$$\frac{\cdot (x-1)(x+1)}{180} =$$

$$= \frac{x^4 + 2x^3 - 9x^2 - 2x + 8}{24} + \frac{x^4 + 5x^3 - 16x^2 - 4x - 16}{15}$$

$$= \frac{x^4 + 4x^3 - x^2 - 4x^2 - 4x^2 - 16x + 4x + 16}{9} -$$

$$-\frac{47x^4 + 188x^3 - 47x^2 - 188x + 94x^3 + 378x^2}{72}$$

$$-\frac{94x - 376}{180} - \frac{(47x^2 - 188)(x^2 - 1)}{180} \approx$$

$$= (-15(x^4 + 2x^3 - 9x^2 - 2x + 2) + 24(x^4 + 5x^3 - 20x^2 - 16) - 40(x^4 + 3x^3 - 8x^2 - 12x + 16) - 5(47x^4 + 282x^3 + 329x^2 - 282x - 376) - 2(47x^4 - 235x^2 + 188)) : 360 =$$

$$= (-15x^4 - 30x^3 + 135x^2 + 30x - 120 + 244x^4 - 480x^3 - 324 - 40x^4 + 320x^2 + 480x - 640 - 235x^4 - 1410x^3 - 1645x^2 + 1410x + 1280 -$$

$$\frac{-84x^7 + 470x^2 - 376}{360} =$$

$$\frac{-360x^7 - 1440x^3 - 720x^2 + 1440x + 360}{360}$$

$$= -x^4 - 4x^3 - 2x^2 + 4x + 1$$

№ 1) Проверка

$$P(-2) = 1$$

ОТВ:

$$P(1) = -2$$

$$\underline{P(x) = -x^4 - 4x^3 - 2x^2 + 4x + 1}$$

$$P(-1) = -2$$

$$P(-2) = -47$$

$$P(-4) = -47$$

v 8

$$\frac{4}{16} \bmod 97$$

$$16x = 4 \bmod 97$$

$$16x - 97y = 4$$

$$\text{GCD}(97, 16) = 1$$

DAX

$$16x_0 - 97y_0 = 1$$

$$t = 97 \cdot 1 - 16 \cdot 6 \rightarrow x_0 = -6$$

$$y_0 = -1$$

$$\begin{cases} X = -24 - 97k \\ k \in \mathbb{Z} \end{cases}$$

$$Y = -4 - 16k$$

$$[-24 = 73 \bmod 97]$$

$$k = -1$$

$$X = 73$$

(OTB, ~~X = -3~~)
73