Задание 1: $K = 18$

$$h^2 \le 18 < (h+1)^2$$

$h = \left(h + \frac{N}{h}\right)/2$: $h = \left(18 + \frac{18}{18}\right)/2 = 9,5$;

$h = \left(9,5 + \frac{18}{9,5}\right)/2 = 5,7$;

$h = \frac{5,7 + \frac{18}{5,7}}{2} = 4,4$;

$h = \frac{4,4 + \frac{18}{4,4}}{2} = 4,2$;

$h = \frac{4,2 + \frac{18}{4,2}}{2} = 4,2$

$\Rightarrow h = 4$

Ответ: 4

Задание 2: $C = 2002$ $\sqrt{C} = 44,7$

$\{2, 3, \dots 44\}$

$C = 2 \cdot 1001$;

$C = 2 \cdot 500 + 1$;

$C = 3 \cdot 333 + 2$;

$C = 5 \cdot 200 + 1$;

$C = 7 \cdot 143$;

$C = 7 \cdot 20 + 3$;

$C = 11 \cdot 13$;

d	i	C	k
2	1	1001	1
			2
			3
7	2	143	4
11	3	13	

d	i	C	k

$C = 11 \cdot 1 + 2;$

$C = 13 \cdot 1;$ | 13

$C = 2002 = 2 \cdot 7 \cdot 11 \cdot 13$

Задание 3 $a = 65$ $b = 72$ $c = 2002$

$65x + 72y = 2002$

1) $НОД(65; 72) = 1$

2) Сократим на НОД: $a = 65$; $b = 72$; $c = 2002$

3) Пусть $x_0 = 2$; $y_0 = 26$

$65 \cdot 2 + 72 \cdot 26 = 2002$

4) $x_1 = x_0 \cdot c$ $\quad y_1 = y_0 \cdot c$

$x_1 = 4004$ $\quad y_1 = 52052$

5) Общий вид:

$$\begin{cases} x = x_1 + bk \\ y = y_1 - ak \end{cases} \Rightarrow \begin{cases} x = 4004 + 72k \\ y = 52052 - 65k \end{cases}$$

Ответ: $\begin{cases} x = 4004 + 72k \\ y = 52052 - 65k \end{cases}$ $k \in Z$

Задание 4.1 $3_5 x + 344_5 = 1133_5$

I способ

$3_5 x + 344_5 = 1133_5$

$3_5 \cdot x = 1133_5 - 344_5$

$3_5 x = 234_5$

$x = \frac{234_5}{3_5}$

$x = 43_5$

$43_5 = 4 \cdot 5 + 3 = 23_{10}$

$$\begin{array}{r} 1133 \\ -\ 344 \\ \hline 234 \end{array}$$

$$\begin{array}{l|l} 234 & 3 \\ \hline 22 & 43 \\ -14 & \\ \ \ 14 & \\ \hline \ \ \ 0 & \end{array}$$

II способ

$3_5 = 3_{10}$; $\overset{2\,1\,0}{344_5} = 25 \cdot 3 + 5 \cdot 4 + 4 = 99_{10}$

~~2002_3~~ $\overset{3\,2\,1\,0}{1133_5} = 125 + 25 + 5 \cdot 3 + 3 = 168_{10}$

$3x + 99 = 168$

$3x = 69$

$x = 23$

Ответ: $23 = x$