Exercise 1.

1. $h^2 \le 36205 < (h+1)^2$

$h - ?$

$h = (36205 + \frac{36205}{36205}) / 2 = \frac{36206}{2} = 18103$

$h = (18103 + \frac{36205}{18103}) / 2 = \frac{18104}{2} = 9052$

$h = (9052 + \frac{36205}{9052}) / 2 = \frac{9055}{2} = 4527$

$h = (4527 + \frac{36205}{4527}) / 2 = \frac{4534}{2} = 2267$

$h = (2267 + \frac{36205}{2267}) / 2 = \frac{2282}{2} = 1141$

$h = (1141 + \frac{36205}{1141}) / 2 = \frac{1172}{2} = 586$

$h = (586 + \frac{36205}{586}) / 2 = \frac{647}{2} = 323$

$h = (323 + \frac{36205}{323}) / 2 = \frac{435}{2} = 217$

$h = (217 + \frac{36205}{217}) / 2 = \frac{383}{2} = 191$

$h = (191 + \frac{36205}{191}) / 2 = \frac{380}{2} = 190$

$h = (190 + \frac{36205}{190}) / 2 = \frac{380}{2} = 190$

Ответ: $h = 190$.

2. $2002 = 1001 \cdot 2 = 143 \cdot 7 \cdot 2 = 13 \cdot 11 \cdot 7 \cdot 2$

Ответ: $2002 = 2 \cdot 7 \cdot 11 \cdot 13$

3. $59x + 30y = 2002$

$59 = 30 \cdot 1 + 29$ ↑

$30 = 29 \cdot 1 + 1$ |

$29 = 1 \cdot 29$

$59x_0 + 30y_0 = 1$

$1 = 30 - 29$

$29 = 59 - 30$

$1 = 30 - (59 - 30)$

$1 = 59 \cdot (-1) + 2 \cdot 30$

$x_0 = -1, \quad y_0 = 2$

$59 \cdot 2002x_0 + 30 \cdot 2002y_0 = 2002$

$59 \cdot (2002x_0 + 30k) + 30 \cdot (2002y_0 - 59k) = 2002$

Ответ: $x = -2002 + 30k$, $y = 4004 - 59k$

4.2. $3x + 112_7 = 346_7$

I. $\overset{2}{1}\overset{1}{1}\overset{0}{2}_7 = 49 + 7 + 2 = 58_{10}$; $\overset{2}{3}\overset{1}{4}\overset{0}{6}_7 = 147 + 28 + 6 = 181_{10}$

$3x + 58_{10} = 181_{10}$

$3x = 123$

$x = 41_{10}$

$x = 56_7$

4	1	7		
3	5	5		7
6		0		0
		5		

II.

$$\begin{array}{r} -\ 346_7 \\ \underline{\quad 112_7} \\ 234_7 \end{array}$$

$$3X = 234_7$$

$$\begin{array}{r|l} -\ 234 & 3 \\ \underline{21} & \underline{\quad} \\ 24 & 56_7 \\ \underline{24} & \\ 0 & \end{array}$$

$$x = 56_7$$