зад1

A) Dec → Bin

$98_{(10)} → 1100010_{(2)}$

64	32	16	8	4	2	1
1	1	0	0	0	1	0

| | 32 | 16 | 8 | 4 | 2 | 1 |

$56_{(10)} → 111000_{(2)}$

$31_{(10)} → 11111_{(2)}$

$32_{(10)} → 100000_{(2)}$

| | 32 | 16 | 8 | 4 | 2 | 1 |

| 512 | 256 | 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 |

$1000_{(10)} → 1111101000_{(2)}$

B) Bin → Dec

$10_{(2)} = 1 \cdot 2^1 + 0 \cdot 2^0 = 2_{(10)}$

$11101_{(2)} = 1 \cdot 2^4 + 1 \cdot 2^3 + 1 \cdot 2^2 + 0 \cdot 2^1 + 1 \cdot 2^0$

$11101_{(2)} = 16 + 8 + 4 + 0 \cdot 2 + 1 = 29_{(10)}$

$1111_{(2)} = 1 \cdot 2^3 + 1 \cdot 2^2 + 1 \cdot 2^1 + 1 \cdot 2^0 = 8 + 4 + 2 + 1 = 15_{(10)}$

$11110_{(2)} = 1 \cdot 2^4 + 1 \cdot 2^3 + 1 \cdot 2^2 + 1 \cdot 2^1 + 0 \cdot 2^0$

$11110_{(2)} = 16 + 8 + 4 + 2 + 0 = 30_{(10)}$

$11011_{(2)} = 1 \cdot 2^4 + 1 \cdot 2^3 + 0 \cdot 2^2 + 1 \cdot 2^1 + 1 \cdot 2^0$

$11011_{(2)} = 16 + 8 + 0 + 2 + 1 = 27_{(10)}$

$1001_{(2)} = 1 \cdot 2^3 + 0 \cdot 2^2 + 0 \cdot 2^1 + 1 \cdot 2^0 = 8 + 0 + 0 + 1 = 9_{(10)}$

C) Dec → Hex

$48_{(10)} = 30_{(16)}$

48 : 16 = 3 ост. 0 ↑

3 : 16 = 0 ост. 3

1.

$156_{(10)} = 9C_{(16)}$

$156 : 16 = 9$ ост. $12 \Rightarrow C \uparrow$

$9 : 16 = 0$ ост. 9

~~$321 = 16$~~ $321_{(10)} = 141_{(16)}$

$321 : 16 = 20$ ост. $1 \uparrow$

$20 : 16 = 1$ ост. 4

$1 : 16 = 0$ ост. 1

$255_{(10)} = FF_{(16)}$

$255 : 16 = 15$ ост. $15 = F \uparrow$

$15 : 16 = 0$ ост. $15 = F$

$1024_{(10)} = 400_{(16)}$

$1024 : 16 = 64$ ост. $0 \uparrow$

$64 : 16 = 4$ ост. 0

$4 : 16 = 0$ ост. 4

$8_{(10)} = 8_{(16)}$

$100_{(16)} = 64_{(16)}$

$100 : 16 = 6$ ост. $4 \uparrow$

$6 : 16 = 0$ ост. 6

D) Hex $\Rightarrow$ Dec

$A_{(16)} = 10_{(10)}$

$100_{(16)} = 1 \cdot 16^2 + 0 \cdot 16^1 + 0 \cdot 16^0 = 256_{(10)}$

$3E_{(16)} = 3 \cdot 16 + E \cdot 16^0 = 48 + 14 \cdot 1 = 62_{(10)}$

$1EA_{(16)} = 1 \cdot 16^2 + E \cdot 16^1 + A \cdot 16^0$

$1EA_{(16)} = 256 + 14 \cdot 16 + 10 \cdot 1 = 256 + 224 + 10 = 490_{(10)}$

$ABC_{(16)} = A \cdot 16^2 + B \cdot 16^1 + C \cdot 16^0 = 10 \cdot 256 + 11 \cdot 16 + 12 \cdot 1$

$ABC_{(16)} = 2748_{(10)}$

E) Hex → Bin

$B_{(16)} = \overset{8\ 4\ 2\ 1}{1011}_{(2)}$

$200_{(16)} = 0010\,00000000_{(2)}$

$3E_{(16)} = \underset{3}{\underbrace{0011}}\,\underset{E}{\underbrace{1110}}_{(2)}$

$13A_{(16)} = \underset{1}{\underbrace{0001}}\,\underset{3}{\underbrace{0011}}\,\underset{A}{\underbrace{1010}}_{(2)}$

$1EA_{(16)} = 0001\ 1110\ 1010_{(2)}$

$CAB_{(16)} = 1100\ 1010\ 1011_{(2)}$

$ED_{(16)} = 1110\ 1101_{(2)}$

F) Bin → Hex

$\overset{4\ 2\ 1}{110}_{(2)} = 6_{(16)}$

$0110\,0101_{(2)} = 65_{(16)}$

$11\,0011_{(2)} = 33_{(16)}$

$0001\,0111\,0110_{(2)} = 176_{(16)}$

G) Dec → Oct

$8_{(10)} = 10_{(8)}$

$8 : 8 = 1\ \text{ost. } 0 \uparrow$

$1 : 8 = 0\ \text{ost. } 1 \uparrow$

3.

$56_{(10)} = 70_{(8)}$

$56 : 8 = 7$ ост. 0 ↑

$7 : 8 = 0$ ост. 7

$31_{(10)} = 37_{(8)}$

$31 : 8 = 3$ ост. 7

$3 : 8 = 0$ ост. 3

$7_{(10)} = 7_{(8)}$ $2_{(10)} = 2_{(8)}$

$1000_{(10)} = 1750_{(8)}$

$1000 : 8 = 125$ ост. 0

$125 : 8 = 15$ ост. 5

$15 : 8 = 1$ ост. 7

$1 : 8 = 0$ ост. 1

$111_{(10)} = 157_{(8)}$

$111 : 8 = 13$ ост. 7

$13 : 8 = 1$ ост. 5

$1 : 8 = 0$ ост. 1

H) Oct → Dex

$25_{(8)} = 2 \cdot 8 + 5 \cdot 8^0 = 16 + 5 = 21_{(10)}$

$10_{(8)} = 1 \cdot 8^1 + 0 \cdot 8^0 = 8_{(10)}$

$24_{(8)} = 2 \cdot 8^1 + 4 \cdot 8^0 = 16 + 4 = 20$

$7_{(8)} = 7_{(10)}$

$2_{(8)} = 2 \cdot 8^0 = 2_{(10)}$

4

I) Троична БС → Четвъртична БС

$120_{(3)} = 1 \cdot 3^2 + 2 \cdot 3^1 + 0 \cdot 3^0 = 9 + 3 = 12_{(10)}$

$12 : 4 = 3$ ост. 0

$3 : 4 = 0$ ост. 3

$120_{(3)} = 30_{(4)}$

$120_{(3)} = 1 \cdot 3^2 + 2 \cdot 3^1 + 0 \cdot 3^0 = 9 + 6 = 15_{(10)}$

$15 : 4 = 3$ ост. 3

$3 : 4 = 0$ ост. 3

$\Rightarrow 120_{(3)} = 33_{(4)}$

$10_{(3)} = 1 \cdot 3^1 + 0 \cdot 3^0 = 3_{(10)}$

$3 : 4 = 0$ ост. 3

$\Rightarrow 10_{(3)} = 3_{(4)}$

$21_{(3)} = 2 \cdot 3^1 + 1 \cdot 3^0 = 6 + 1 = 7_{(10)}$

$7 : 4 = 1$ ост. 3

$1 : 4 = 0$ ост. 1

$21_{(3)} = 13_{(4)}$

$2110_{(3)} = 2 \cdot 3^3 + 1 \cdot 3^2 + 1 \cdot 3^1 + 0 \cdot 3^0 = 54 + 9 + 3$

$2110_{(3)} = 66_{(10)}$

$66 : 4 = 16$ ост. 2)

$16 : 4 = 4$ ост. 0

$4 : 4 = 1$ ост. 0

$1 : 4 = 0$ ост. 1

$2110_{(3)} = 1002_{(4)}$

$112_{(3)} = 1 \cdot 3^2 + 1 \cdot 3^1 + 2 \cdot 3^0 = 9 + 3 + 2 = 14_{(10)}$

$14 : 4 = 3$ ост. 2

$3 : 4 = 0$ ост. 3

$\Rightarrow 112_{(3)} = 32_{(4)}$

$111221_{(3)} = 1 \cdot 3^5 + 1 \cdot 3^4 + 1 \cdot 3^3 + 2 \cdot 3^2 + 2 \cdot 3^1 + 1 \cdot 3^0$

$111221_{(3)} = 243 + 81 + 27 + 2 \cdot 9 + 6 + 1$

$11221_{(3)} = 376_{(10)}$

$376 : 4 = 94$ ост. 0

$94 : 4 = 23$ ост. 2

$23 : 4 = 5$ ост. 3

$5 : 4 = 1$ ост. 1

$1 : 4 = 0$ ост. 1

$\Rightarrow 11320_{(4)} = 111221_{(3)}$

$100_{(3)} = 1 \cdot 3^2 + 0 \cdot 3^1 + 0 \cdot 3^0 = 9_{(10)}$

$9 : 4 = 2$ ост. 1

$2 : 4 = 0$ ост. 2

$100_{(3)} = 21_{(4)}$

$110_{(3)} = 1 \cdot 3^2 + 1 \cdot 3^1 + 0 \cdot 3^0 = 9 + 3 = 12_{(10)}$

$12_{(10)} : 4 = 3$ ост. 0

$3 : 4 = 0$ ост. 3

$110_{(3)} = 30_{(4)}$

6.