

Переведите числа в десятичную систему счисления

1	11100_2	?	13	153_8	?
2	110010_2	?	14	39_{16}	?
3	1000100_2	?	15	203_8	?
4	101101_2	?	16	$5F_{16}$	?
5	100010_2	?	17	127_8	?
6	10111_2	?	18	113_{16}	?
7	1100011_2	?	19	215_8	?
8	101011_2	?	20	$4E_{16}$	?
9	100111_2	?	21	106_8	?
10	110100_2	?	22	$2C_{16}$	?
11	1100101_2	?	23	224_8	?
12	110001_2	?	24	108_{16}	?



Переведите десятичные числа в указанную систему счисления

25	$55_{10} = x_2$	?	37	$55_{10} = x_8$	?
26	$100_{10} = x_2$	?	38	$55_{10} = x_{16}$	?
27	$93_{10} = x_2$	?	39	$88_{10} = x_8$	?
28	$64_{10} = x_2$	?	40	$111_{10} = x_{16}$	?
29	$128_{10} = x_2$	?	41	$165_{10} = x_8$	?
30	$47_{10} = x_2$	?	42	$165_{10} = x_{16}$	?
31	$75_{10} = x_2$	?	43	$94_{10} = x_8$	?
32	$88_{10} = x_2$	?	44	$182_{10} = x_{16}$	?
33	$60_{10} = x_2$	?	45	$100_{10} = x_8$	?
34	$111_{10} = x_2$	?	46	$90_{10} = x_{16}$	?
35	$97_{10} = x_2$	?	47	$162_{10} = x_8$	?
36	$86_{10} = x_2$	?	48	$170_{10} = x_{16}$	?



Переведите десятичную дробь в указанную системы счисления

49	$0,65625_{10} = X_{16}$	?
50	$0,825_{10} = X_8$	?
51	$0,875_{10} = X_2$	?
52	$0,65625_{10} = X_8$	?
53	$0,5625_{10} = X_2$	?
54	$0,7_{10} = X_2$	?

Перевод чисел, содержащих целую и дробную часть осуществляется в два этапа. Отдельно переводится целая часть, отдельно – дробная.

$$17,25_{10} = 10001,01_2$$

17	8	4	2	1	0
1	0	0	0	1	

←

0,	25
	x 2
0	50
	x 2
1	00



Выполните арифметические операции в двоичной системе счисления

55	$1001_2 + 1010_2$	?
56	$1101_2 + 1011_2$	?
57	$1110_2 - 1001_2$	?
58	$10110_2 - 1101_2$	?
59	$1110_2 * 1001_2$	?
60	$1011_2 * 1010_2$	?
61	$1010_2 : 10_2$	?
62	$1111_2 : 101_2$	?



Перевод чисел из двоичной системы счисления в систему счисления с основанием 2^n и обратно

63	$100111011011_2 = X_8$	?
64	$100111011011_2 = X_{16}$	?
65	$11101001100_2 = X_8$	?
66	$1101001100_2 = X_{16}$	?
67	$536_8 = X_2$	?
68	$536_{16} = X_2$	?
69	$3702_8 = X_2$	?
70	$9B04_{16} = X_2$	?

Например: $1\mathbf{010}110\mathbf{101}_2 = X_8$

1	010	110	101
1	2	6	5

$$1010110101_2 = 1265_8$$

Например: $4A09_{16} = X_2$

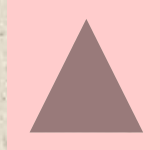
4	A	0	9
0100	1010	0000	1001

$$4A09_{16} = 100\mathbf{1010}0000\mathbf{1001}_2$$



4 3 2 1 0

$$11100_2 = 2^4 + 2^3 + 2^2 = 16 + 8 + 4 = 28$$



5 4 3 2 1 0

$$110010_2 = 2^5 + 2^4 + 2^1 = 32 + 16 + 2 = 50$$



6 5 4 3 2 1 0

$$1000100_2 = 2^6 + 2^2 = 64 + 4 = 68$$



5 4 3 2 1 0

$$101101_2 = 2^5 + 2^3 + 2^2 + 2^0 = 32 + 8 + 4 + 1 = 45$$



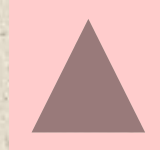
5 4 3 2 1 0

$$100010_2 = 2^5 + 2^1 = 32 + 2 = 34$$



4 3 2 1 0

$$10111_2 = 2^4 + 2^2 + 2^1 + 2^0 = 16 + 4 + 2 + 1 = 23$$



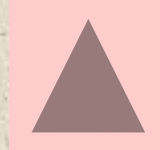
6 5 4 3 2 1 0

$$1100011_2 = 2^6 + 2^5 + 2^1 + 2^0 = 64 + 32 + 2 + 1 = 99$$



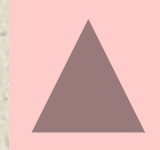
5 4 3 2 1 0

$$101011_2 = 2^5 + 2^3 + 2^1 + 2^0 = 32 + 8 + 2 + 1 = 43$$



5 4 3 2 1 0

$$100111_2 = 2^5 + 2^2 + 2^1 + 2^0 = 32 + 4 + 2 + 1 = 39$$



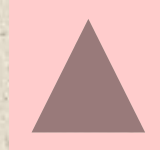
5 4 3 2 1 0

$$110100_2 = 2^5 + 2^4 + 2^2 = 32 + 16 + 4 = 52$$



6 5 4 3 2 1 0

$$1100101_2 = 2^6 + 2^5 + 2^2 + 2^0 = 64 + 32 + 4 + 1 = 101$$



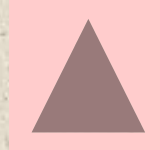
5 4 3 2 1 0

$$110001_2 = 2^5 + 2^4 + 2^0 = 32 + 16 + 1 = 49$$



2 1 0

$$153_8 = 1*8^2 + 5*8^1 + 3*8^0 = 64 + 40 + 3 = 107$$



1 0

$$39_{16} = 3 \cdot 16^1 + 9 \cdot 16^0 = 48 + 9 = 57$$



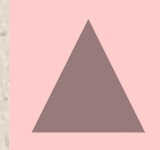
2 1 0

$$203_8 = 2 \cdot 8^2 + 3 \cdot 8^0 = 128 + 3 = 131$$



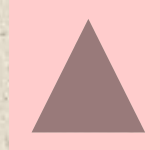
1 0

$$5F_{16} = 5*16^1 + 15*16^0 = 80 + 15 = 95$$



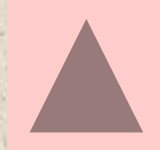
2 1 0

$$127_8 = 1*8^2 + 2*8^1 + 7*8^0 = 64 + 16 + 7 = 87$$



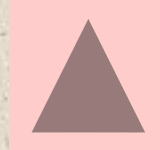
2 1 0

$$113_{16} = 1*16^2 + 1*16^1 + 3*16^0 = 256 + 16 + 3 = 275$$



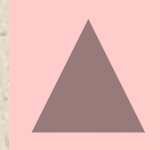
2 1 0

$$215_8 = 2*8^2 + 1*8^1 + 5*8^0 = 128 + 8 + 5 = 141$$



1 0

$$4E_{16} = 4*16^1 + 14*16^0 = 64 + 14 = 78$$



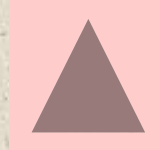
2 1 0

$$106_8 = 1 \cdot 8^2 + 6 \cdot 8^0 = 64 + 6 = 70$$



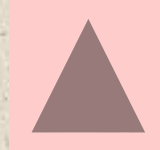
1 0

$$2C_{16} = 2 \cdot 16^1 + 12 \cdot 16^0 = 32 + 12 = 44$$



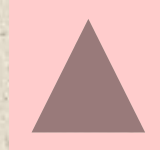
2 1 0

$$224_8 = 2*8^2 + 2*8^1 + 4*8^0 = 128 + 16 + 4 = 148$$



2 1 0

$$108_{16} = 1*16^2 + 8*16^0 = 256 + 8 = 264$$



$$55_{10} = X_2$$

Частные: **55 27 13 6 3 1 0**

Остатки: **1 1 1 0 1 1**



$$55_{10} = 110111_2$$



$$100_{10} = X_2$$

Частные: 100 50 25 12 6 3 1 0

Остатки: 0 0 1 0 0 1 1



$$100_{10} = 1100100_2$$



$$93_{10} = X_2$$

Частные: 93 46 23 11 5 2 1 0

Остатки: 1 0 1 1 1 0 1



$$93_{10} = 1011101_2$$



$$64_{10} = X_2$$

Частные: **64** **32** **16** **8** **4** **2** **1** **0**

Остатки: **0** **0** **0** **0** **0** **0** **0** **1**



$$64_{10} = 10000000_2$$



$$128_{10} = X_2$$

Частные: 128 64 32 16 8 4 2 1 0

Остатки: 0 0 0 0 0 0 0 0 1



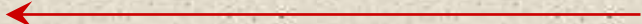
$$128_{10} = 10000000_2$$



$$47_{10} = X_2$$

Частные: 47 23 11 5 2 1 0

Остатки: 1 1 1 1 0 1



$$47_{10} = 101111_2$$



$$75_{10} = X_2$$

Частные: 75 37 18 9 4 2 1 0

Остатки: 1 1 0 1 0 0 1



$$75_{10} = 1001011_2$$



$$88_{10} = X_2$$

Частные: 88 44 22 11 5 2 1 0

Остатки: 0 0 0 1 1 0 1



$$88_{10} = 1011000_2$$



$$60_{10} = X_2$$

Частные: 60 30 15 7 3 1 0

Остатки: 0 0 1 1 1 1



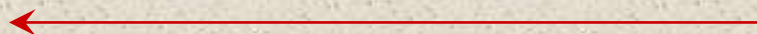
$$60_{10} = 111100_2$$



$$111_{10} = X_2$$

Частные: 111 55 27 13 6 3 1 0

Остатки: 1 1 1 1 0 1 1



$$111_{10} = 110111_2$$



$$97_{10} = X_2$$

Частные: 97 48 24 12 6 3 1 0

Остатки: 1 0 0 0 0 1 1



$$97_{10} = 1100001_2$$



$$86_{10} = X_2$$

Частные: 86 43 21 10 5 2 1 0

Остатки: 0 1 1 0 1 0 1



$$86_{10} = 1010110_2$$



$$55_{10} = X_8$$

Частные: 55 6 0

Остатки: 7 6
 ←

$$55_{10} = 67_8$$



$$55_{10} = X_{16}$$

Частные: **55** **3** **0**

Остатки: **7** **3**
 ←

$$55_{10} = 37_{16}$$



$$88_{10} = X_8$$

Частные: **88** **11** **1** **0**

Остатки: **0** **3** **1**



$$88_{10} = 130_8$$



$$111_{10} = X_{16}$$

Частные: **111** **6** **0**

Остатки: **15** **6**



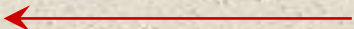
$$111_{10} = 6F_{16}$$



$$165_{10} = X_8$$

Частные: **165** **20** **2** **0**

Остатки: **5** **4** **2**



$$165_{10} = 245_8$$



$$165_{10} = X_{16}$$

Частные: 165 10 0

Остатки: 5 10
←

$$165_{10} = A5_{16}$$



$$94_{10} = X_8$$

Частные: **94 11 1 0**

Остатки: **6 3 1**



$$94_{10} = 136_8$$



$$182_{10} = X_{16}$$

Частные: **182** **11** **0**

Остатки: **6** **11**
 ←

$$182_{10} = B6_{16}$$



$$100_{10} = X_8$$

Частные: **100** **12** **1** **0**

Остатки: **4** **4** **1**
 ←—————

$$100_{10} = 144_8$$



$$90_{10} = X_{16}$$

Частные: 90 5 0

Остатки: 10 5
←

$$90_{10} = 5A_{16}$$



$$162_{10} = X_8$$

Частные: **162** **20** **2** **0**

Остатки: **2** **4** **2**
 ←

$$162_{10} = 242_8$$



$$170_{10} = X_{16}$$

Частные: 170 10 0

Остатки: 10 10



$$170_{10} = AA_{16}$$



$$0,65625_{10} = X_{16}$$

↓	0,	65625
	x	16
	10	50000
	(A)	x 16
	8	00000

$$0,65625_{10} = 0,A8_{16}$$



$$0,825_{10} = X_8$$

0,	825
	x 8
6	600
	x 8
4	800
	x 8
6	400
	x 8
3	200
	...

$$0,825_{10} \approx 0,6463_8$$



$$0,875_{10} = X_2$$

	0,	875
		x 2
1		750
		x 2
1		500
		x 2
1		000

$$0,875_{10} = 0,111_2$$



$$0,65625_{10} = X_8$$

↓	0,	65625
	x	8
	5	25000
	x	8
	2	00000

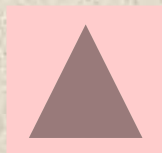
$$0,65625_{10} = 0,52_8$$



$$0,5625_{10} = X_2$$

	0,	5625
	x	2
1		1250
	x	2
0		2500
	x	2
0		5000
	x	2
1		0000

$$0,5625_{10} = 0,1001_2$$



$$0,7_{10} = X_2$$

0,	7
x	2
1	4
x	2
0	8
x	2
1	6
x	2
1	2
...	...

$$0,7_{10} \approx 0,1011_2$$



$$1001_2 + 1010_2 = 10011_2$$

$$\begin{array}{r} 1001 \\ + 1010 \\ \hline 10011 \end{array}$$



$$1101_2 + 1011_2 = 11000_2$$

$$\begin{array}{r} 1101 \\ + 1011 \\ \hline 11000 \end{array}$$



$$1110_2 - 1001_2 = 101_2$$

$$\begin{array}{r} 1110 \\ - 1001 \\ \hline 101 \end{array}$$



$$10110_2 - 1101_2 = 1001_2$$

$$\begin{array}{r} 10110 \\ - 1101 \\ \hline 1001 \end{array}$$



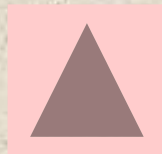
$$1110_2 * 1001_2 = 1111110_2$$

$$\begin{array}{r} 1110 \\ * 1001 \\ \hline 1110 \\ + 1110 \\ \hline 1111110 \end{array}$$

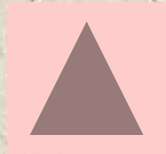


$$1011_2 * 1010_2 = 1101110_2$$

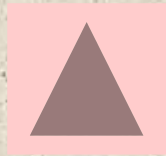
$$\begin{array}{r} 1011 \\ * 1010 \\ \hline 1011 \\ + 1011 \\ \hline 1101110 \end{array}$$



$$1010_2 : 10_2 = 101_2$$



$$1111_2 : 101_2 = 11_2$$



$$100111011011_2 = X_8$$

100	111	011	011
4	7	3	3

$$100111011011_2 = 4733_8$$



$$100111011011_2 = X_{16}$$

1001	1101	1011
9	13 (D)	11 (B)

$$100111011011_2 = 9DB_{16}$$



$$11101001100_2 = X_8$$

11	101	001	100
3	5	1	4

$$11101001100_2 = 3514_8$$



$$1101001100_2 = X_{16}$$

11	0100	1100
3	4	12 (C)

$$1101001100_2 = 34C_{16}$$



$$536_8 = X_2$$

5	3	6
101	011	110

$$536_8 = 101011110_2$$



$$536_{16} = X_2$$

5	3	6
101	0011	0110

$$536_{16} = 10100110110_2$$



$$3702_8 = X_2$$

3	7	0	2
11	111	000	010

$$3702_8 = 11111000010_2$$



$$9B04_{16} = X_2$$

9	B	0	4
1001	1011	0000	0100

$$9B04_{16} = 1001101100000100_2$$

