

1.3 Konversi decimal angka 250,5 ke:

- a. base 4
- b. base 8
- c. base 16

Jawab :

A. base 4

$$250 : 4 = 62 \text{ sisa } 2$$

$$62 : 4 = 15 \text{ sisa } 2$$

$$15 : 4 = 3 \text{ sisa } 3$$

$$3 : 4 = 0 \text{ sisa } 3$$

$$0.5 \times 4 = 2.0 \text{ ambil } 2$$

$$3322.2_{(4)}$$

B. base 8

$$250 : 8 = 31 \text{ sisa } 2$$

$$31 : 8 = 3 \text{ sisa } 7$$

$$3 : 8 = 0 \text{ sisa } 3$$

$$0.5 \times 8 = 4.0 \text{ ambil } 4$$

$$372.4_{(8)}$$

C. base 16

$$250 : 16 = 15 \text{ sisa } 10$$

$$15 : 16 = 0 \text{ sisa } 15$$

$$0.5 \times 16 = 8.0 \text{ ambil } 8$$

FA.8₍₁₆₎

1.4 Ubah bilangan decimal berikut ini menjadi biner!

a. 12.0625 b. 1000

c. 673,23 d. 1798

Jawab :

A. 12.0625₍₁₀₎

$12 : 2 = 6$ sisa 0

$6 : 2 = 3$ sisa 0

$3 : 2 = 1$ sisa 1

$1 : 2 = 0$ sisa 1

$0.0625 \times 2 = 0.125$ ambil 0

$0.125 \times 2 = 0.25$ ambil 0

$0.25 \times 2 = 0.5$ ambil 0

$0.5 \times 2 = 1.0$ ambil 1

1100.001₍₂₎

B. $1000_{(10)}$

$$1000 : 2 = 500 \text{ sisa } 0$$

$$500 : 2 = 250 \text{ sisa } 0$$

$$250 : 2 = 125 \text{ sisa } 0$$

$$125 : 2 = 62 \text{ sisa } 1$$

$$62 : 2 = 31 \text{ sisa } 0$$

$$31 : 2 = 15 \text{ sisa } 1$$

$$15 : 2 = 7 \text{ sisa } 1$$

$$7 : 2 = 3 \text{ sisa } 1$$

$$3 : 2 = 1 \text{ sisa } 1$$

$$1 : 2 = 0 \text{ sisa } 1$$

$1111101000_{(2)}$

C. $673.23_{(10)}$

$$673 : 2 = 336 \text{ sisa } 1$$

$$336 : 2 = 168 \text{ sisa } 0$$

$$168 : 2 = 84 \text{ sisa } 0$$

$$84 : 2 = 42 \text{ sisa } 0$$

$$42 : 2 = 21 \text{ sisa } 0$$

$$21 : 2 = 10 \text{ sisa } 1$$

$$10 : 2 = 5 \text{ sisa } 0$$

$$5 : 2 = 2 \text{ sisa } 1$$

$$2 : 2 = 1 \text{ sisa } 0$$

$$1 : 2 = 0 \text{ sisa } 1$$

$$0.23 \times 2 = 0.46 \text{ ambil } 0$$

$$0.46 \times 2 = 0.92 \text{ ambil } 0$$

$$0.92 \times 2 = 1.84 \text{ ambil } 1$$

$$0.84 \times 2 = 1.68 \text{ ambil } 1$$

$$0.68 \times 2 = 1.36 \text{ ambil } 1$$

$$0.36 \times 2 = 0.72 \text{ ambil } 0$$

$$0.72 \times 2 = 1.44 \text{ ambil } 1$$

$$0.44 \times 2 = 0.88 \text{ ambil } 0$$

$$0.88 \times 2 = 1.76 \text{ ambil } 1$$

$$0.76 \times 2 = 1.52 \text{ ambil } 1$$

1010100001.0011101011.....1₍₂₎

D. 1798₍₁₀₎

$$1798 : 2 = 899 \text{ sisa } 0$$

$$899 : 2 = 449 \text{ sisa } 1$$

$$449 : 2 = 224 \text{ sisa } 1$$

$$224 : 2 = 112 \text{ sisa } 0$$

$$112 : 2 = 56 \text{ sisa } 0$$

$$56 : 2 = 28 \text{ sisa } 0$$

$$28 : 2 = 14 \text{ sisa } 0$$

$$14 : 2 = 7 \text{ sisa } 0$$

$$7 : 2 = 3 \text{ sisa } 1$$

$$3 : 2 = 1 \text{ sisa } 1$$

$$1 : 2 = 0 \text{ sisa } 1$$

11100000110₍₂₎

1.6 Ubah bilangan ke base yang telah di tentukan!

a. $225.225_{(10)} = \dots_{(2)} = \dots_{(8)} = \dots_{(16)}$

b. $1101001.011_{(2)} = \dots_{(10)} = \dots_{(8)} = \dots_{(16)}$

c. $623,77_{(8)} = \dots_{(10)} = \dots_{(2)} = \dots_{(16)}$

d. $2AC5.D_{(16)} = \dots_{(10)} = \dots_{(8)} = \dots_{(2)}$

Jawab :

A. $225.225_{(10)} = \dots_{(2)} = \dots_{(8)} = \dots_{(16)}$

$$225 : 2 = 112 \text{ sisa } 1$$

$$112 : 2 = 56 \text{ sisa } 0$$

$$56 : 2 = 28 \text{ sisa } 0$$

$$28 : 2 = 14 \text{ sisa } 0$$

$$14 : 2 = 7 \text{ sisa } 0$$

$$7 : 2 = 3 \text{ sisa } 1$$

$$3 : 2 = 1 \text{ sisa } 1$$

$$1 : 2 = 0 \text{ sisa } 1$$

$$0.225 \times 2 = 0.45 \text{ ambil } 0$$

$$0.45 \times 2 = 0.9 \text{ ambil } 0$$

$$0.9 \times 2 = 1.8 \text{ ambil } 1$$

$$0.8 \times 2 = 1.6 \text{ ambil } 1$$

$$0.6 \times 2 = 1.2 \text{ ambil } 1$$

$$0.2 \times 2 = 0.4 \text{ ambil } 0$$

$$0.4 \times 2 = 0.8 \text{ ambil } 0$$

$$11100001.001110011_{(2)}$$

011	100	001	.	001	110	011
3	4	1	.	1	6	3

341.163₍₈₎

1110	0001	.	0011	1001	1000
E	1	.	3	9	8

E1.398₍₁₆₎

B. 1101001.011₍₂₎ = ...₍₁₀₎ = ...₍₈₎ = ...₍₁₆₎

1101001.011₍₂₎

$$(1 \times 2^{-3}) + (1 \times 2^{-2}) + (0 \times 2^{-1}) + (1 \times 2^0) + (0 \times 2^1) + (0 \times 2^2) + (1 \times 2^3) + (0 \times 2^4) + (1 \times 2^5) + (1 \times 2^6) = 0.125 + 0.25 + 0 + 1 + 0 + 0 + 8 + 0 + 32 + 64 =$$

105.375₍₁₀₎

001 101 001 . 011₍₂₎

001	101	001	.	011
1	5	1	.	3

151.3₍₈₎

0110 1001 . 0110₍₂₎

0110	1001	.	0110
6	9	.	6

69.6₍₁₆₎

C. $673.23_{(8)} = \dots_{(10)} = \dots_{(2)} = \dots_{(16)}$

$$(3 \times 8^{-2}) + (2 \times 8^{-1}) + (3 \times 8^0) + (7 \times 8^1) + (7 \times 8^2)$$

$$= (3/64) + (2/8) + 3 + 56 + 384$$

$$= 443.296875_{(10)}$$

673.23

6	7	3	.	2	3
110	111	011	.	010	011

110111011.010011₍₂₎

0001 1011 1011 . 0100 1100₍₂₎

0001	1011	1011	.	0100	1100
1	B	B	.	4	C

1BB.4C₍₁₆₎

D. $2AC5.D_{(16)} = \dots_{(10)} = \dots_{(8)} = \dots_{(2)}$

2	A	C	5	.	D
0010	1010	1100	0101	.	1101

0010101011000101.1101₍₂₎

010 101 011 000 101.110 100₍₂₎

010	101	011	000	101	.	110	100
2	5	3	0	5	.	6	4

25305.64₍₈₎

2AC5.D₍₁₆₎

$$(2 \times 16^3) + (10 \times 16^2) + (12 \times 16^1) + (5 \times 16^0) + (13 \times 16^{-1})$$

$$= 8192 + 2560 + 192 + 5 + (13/16)$$

$$= 10949.8125_{(10)}$$

1.7 Ubahlah bilangan berikut ke decimal:

a. $1001001.001_{(2)}$ e. $0.342_{(6)}$

b. $12121_{(3)}$ f. $50_{(7)}$

c. $1032.2_{(4)}$ g. $8.3_{(9)}$

d. $4310_{(5)}$ h. $198_{(12)}$

Jawab :

A. $1001001.001_{(2)}$

$$(1 \times 2^6) + (0 \times 2^5) + (0 \times 2^4) + (1 \times 2^3) + (0 \times 2^2) + (0 \times 2^1) + (1 \times 2^0) + (0 \times 2^{-1}) + (0 \times 2^{-2}) + (1 \times 2^{-3}) = 64 + 0 + 0 + 8 + 0 + 0 + 1 + 0 + 0 + (1/8) \\ = 73.125_{(10)}$$

B. $12121_{(3)}$

$$(1 \times 3^4) + (2 \times 3^3) + (1 \times 3^2) + (2 \times 3^1) + (1 \times 3^0) = 81 + 54 + 9 + 6 + 1 \\ = 151_{(10)}$$

C. $1032.2_{(4)}$

$$(1 \times 4^3) + (0 \times 4^2) + (3 \times 4^1) + (2 \times 4^0) + (2 \times 4^{-1}) = 64 + 0 + 12 + 2 + (2/4) \\ = 78.5_{(10)}$$

D. $4310_{(5)}$

$$(4 \times 5^3) + (3 \times 5^2) + (1 \times 5^1) + (0 \times 5^0) = 500 + 75 + 5 + 0 = 580_{(10)}$$

E. $0.342_{(6)}$

$$(0 \times 6^0) + (3 \times 6^{-1}) + (4 \times 6^{-2}) + (2 \times 6^{-3}) = 0 + (3/6) + (4/36) + (2/216) \\ = (108/216) + (24/216) + (2/216) = 134/216 = 0.620370370370_{(10)}$$

F. $50_{(7)}$

$$(5 \times 7^1) + (0 \times 7^0) = 35 + 0 = 35_{(10)}$$

G. $8.3_{(9)}$

$$(8 \times 9^0) + (3 \times 9^{-1}) = 8 + (3/9) = 8.33_{(10)}$$

H. $198_{(12)}$

$$(1 \times 12^2) + (9 \times 12^1) + (8 \times 12^0) = 144 + 108 + 8 = 260_{(10)}$$