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1. carilah bilangan biner dari bilangan jecimal berikut!

a. 39_{10} = 39 : 2 = 19 sisa 1
19 : 2 = 9 sisa 1
9 : 2 = 4 sisa 1
4 : 2 = 2 sisa 0
2 : 2 = 1 sisa 0

$39_{10} = 100111_2$

b. 50_{10} = 50 : 2 = 25 sisa 0
25 : 2 = 12 sisa 1
12 : 2 = 6 sisa 0
6 : 2 = 3 sisa 0
3 : 2 = 1 sisa 1

$50_{10} = 110010_2$

c. 79_{10} = 79 : 2 = 39 sisa 1
39 : 2 = 19 sisa 1
19 : 2 = 9 sisa 1
9 : 2 = 4 sisa 1
4 : 2 = 2 sisa 0
2 : 2 = 1 sisa 0

$79_{10} = 1001111_2$

d. 100_{10} = 100 : 2 = 50 sisa 0
50 : 2 = 25 sisa 0
25 : 2 = 12 sisa 1
12 : 2 = 6 sisa 0
6 : 2 = 3 sisa 0
3 : 2 = 1 sisa 1

$100_{10} = 1100100_2$

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2. Diketahui bilangan biner:

A = 1100 0011
B = 1010 0101
C = 1011 0100
D = 0101 1110

Berapah jika:

* a = A + B

```
  1 1 1
  1100 0011
+ 1010 0101
-----------
1011 01000
```

a = 10110100_2

* b = B + C

```
    1   1
  1010 0101
+ 1011 0100
-----------
 10101 1001
```

b = $10101\ 1001_2$

* c = C + D

```
  1 1 1
  1011 0100
+ 0101 1110
-----------
 10001 0010
```

c = $10001\ 0010_2$

* e = A + D

```
  1 1 1 1
  1100 0011
+ 0101 1110
-----------
 10010 0001
```

e = $10010\ 0001_2$

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3. Carilah komplemen 2 dari data biner berikut!

* a=0000 1011

tahap 1 mengubah biner menjadi komplemen 1

0000 1011 = 1111 0100

tahap 2 mengubah komplemen 1 menjadi komplemen 2

1111 0100 = $1111\ 0101_2$

$a = 1111\ 0101_2$

* b = 0101 0101

= 1010 1010

$b = 1010\ 1011_2$

* C = 0100 0110

= 1011 1001

$C = 1011\ 1010_2$

* d = 0011 0011

= 1100 1100

$d = 1100\ 1101_2$

* e = 0011 1000

= 1100 0111

$e = 1100\ 1000_2$

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4. Carilah bilangan biner dari penjumlahan bilangan decimal !

* a. 120 + 10 = 10000010

120_{10} = 120 : 2 = 60 sisa 0
60 : 2 = 30 sisa 0
30 : 2 = 15 sisa 0
15 : 2 = 7 sisa 1
7 : 2 = 3 sisa 1
3 : 2 = 1 sisa 1

$120_{10} = 1111000_2$

10_{10} = 10 : 2 = 5 sisa 0
5 : 2 = 2 sisa 1
2 : 2 = 1 sisa 0

$10_{10} = 1010_2$

$a = 120_{10} + 10_{10} = 1111000 + 1010 = 10000010_2$

$a = 10000010_2$

* b. 87 + 57 = 10010000

87_{10} = 87 : 2 = 43 sisa 1
43 : 2 = 21 sisa 1
21 : 2 = 10 sisa 1
10 : 2 = 5 sisa 0
5 : 2 = 2 sisa 1
2 : 2 = 1 sisa 0

$87_{10} = 1010111_2$

57_{10} = 57 : 2 = 28 sisa 1
28 : 2 = 14 sisa 0
14 : 2 = 7 sisa 0
7 : 2 = 3 sisa 1
3 : 2 = 1 sisa 1

$57_{10} = 111001_2$

b = $87_{10} + 57_{10}$ = 1010111
+ 111001
10010000_2

b = $1001\ 0000_2$

* c = 115 + 125 = 1111 0000

115_{10} = 115 : 2 = 57 sisa 1
57 : 2 = 28 sisa 1
28 : 2 = 14 sisa 0
14 : 2 = 7 sisa 0
7 : 2 = 3 sisa 1
3 : 2 = 1 sisa 1

$115_{10} = 1110011_2$

125_{10} = 125 : 2 = 62 sisa 1
62 : 2 = 31 sisa 0
31 : 2 = 15 sisa 1
15 : 2 = 7 sisa 1
7 : 2 = 3 sisa 1
3 : 2 = 1 sisa 1

$125_{10} = 1111101_2$

$c = 115_{10} + 125_{10}$ = 1110011
+ 1111101
11110000

$c = 1111\ 0000_2$

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d. 125 + 225 = 1010 11110

125_{10} = 125 : 2 = 62 sisa 1
62 : 2 = 31 sisa 0
31 : 2 = 15 sisa 1
15 : 2 = 7 sisa 1
7 : 2 = 3 sisa 1
3 : 2 = 1 sisa 1

$125_{10} = 1111101_2$

225_{10} = 225 : 2 = 112 sisa 1
112 : 2 = 56 sisa 0
56 : 2 = 28 sisa 0
28 : 2 = 14 sisa 0
14 : 2 = 7 sisa 0
7 : 2 = 3 sisa 1
3 : 2 = 1 sisa 1

$225_{10} = 11100001_2$

$d = 125_{10} + 225_{10}$ =

$$\begin{array}{r} {}^{1}\,{}^{1}\,{}^{1}\,{}^{1}\,{}^{1}\,{}^{1}\,{}^{1} \\ 1\,1\,1\,1\,1\,0\,1 \\ 1\,1\,1\,0\,0\,0\,0\,1 \; + \\ \hline 1\,0\,1\,0\,1\,1\,1\,1\,0_2 \end{array}$$

$d = 1010\ 11110_2$

e. 256 + 123 = 101111011

256_{10} = 256 : 2 = 128 sisa 0
128 : 2 = 64 sisa 0
64 : 2 = 32 sisa 0
32 : 2 = 16 sisa 0
16 : 2 = 8 sisa 0
8 : 2 = 4 sisa 0
4 : 2 = 2 sisa 0
2 : 2 = 1 sisa 0

$256_{10} = 100000000_2$

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123_{10} =

123 : 2 = 61 sisa 1
61 : 2 = 30 sisa 1
30 : 2 = 15 sisa 0
15 : 2 = 7 sisa 1
7 : 2 = 3 sisa 1
3 : 2 = 1 sisa 1

$123_{10} = 1111011_2$

P. $256_{10} + 123_{10}$ =

$$\begin{array}{r} 100000000 \\ 1111011+ \\ \hline 101111011 \end{array}$$

P = 101111011_2