Answers

1. a. 110001010
   b. 110010110
   c. 100100001
2. a. FFE8
   b. FEB5
   c. 0BCD
3. a. -1175
   b. 1965
   c. 147
   d. -67
4. a. -75
   b. 42
   c. -16
5. a. 11111011
   b. 11010110
   c. 11110000
6.

a.

A	B	A OR B	NOT(A OR B)
F	F	F	T
F	T	T	F
T	F	T	F
T	T	T	F

b.

A	B	NOT A	NOT B	NOT A OR NOT B
F	F	T	T	T
F	T	T	F	T
T	F	F	T	T
T	T	F	F	F

7. a. 0901
   b. CBFAD
   c. CB6AC
8. a. 329
   b. FED
   c. 496

1)

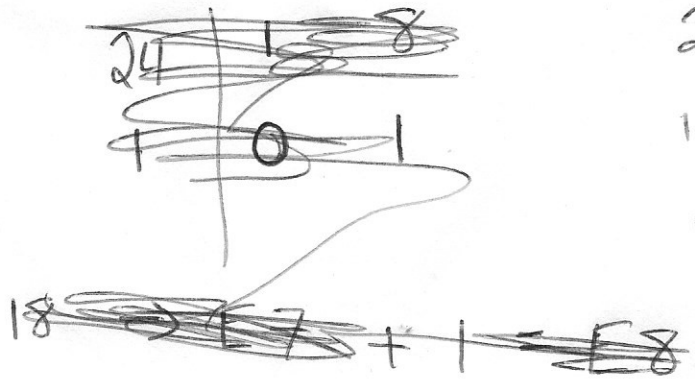
1.
```
  10101111
+ 11011011
------------
 110001010
```

2.
```
  10010111
+ 11111111
------------
 100101110
```

3.
```
  01110101
+ 10101100
------------
 100100001
```

2)

1.



24	12	0
12	6	0
6	3	0
3	1	1
1	0	1

5

11000 → 00000000000011000

```
  11111111111100111
+                 1
------------------
  11111111111101000
```

→ 0x FFE8

2.

331	165	1
165	82	1
82	41	0
41	20	1
20	10	0
10	5	0
5	2	1
2	1	0
1	0	1

101001011

0000000101001011

+ 1111111010110100

1

1111111010110101

0xFEB5

3.

3021	188	13	D
188	11	12	C
11	0	11	B

OBCD

3)

1. B69 → 496 + 1 = 497

$4 \times 16^2 + 9 \times 16^1 + 7 \times 16^0 = 1175$

1175

2. 7AD

$7 \times 16^2 + 10 \times 16^1 + 13 \times 16^0 = 1965$

1965

3. 093

$0 \times 16^2 + 9 \times 16^1 + 3 \times 16^0 = 147$

147

4. FAD

FAD ⇒ 042 + 1 = 043

$0 \times 16^2 + 4 \times 16^1 + 3 \times 16^0 = -67$

-67

4) 1. 10110101

01001010

+ 7 6 5 4 3 2 1 0

01001011

~~$2^7 + 2^4 + 2^3 + 2^1$ = 150~~

$2^6 + 2^3 + 2^1 + 2^0 =$ -75

2. 00101010

$2^5 + 2^3 + 2^1 = \boxed{42}$

3. 11110000

00001111

\+ 1

00010000

$2^4 = \boxed{-16}$

5) 1. -5

00000101

11111010

\+ 1

$\boxed{11111011}$

3. -16

00010000

11101111

\+ 1

$\boxed{11110000}$

2. -42

00101010

11010101

\+ 1

$\boxed{11010110}$

6)

1.

A	B	AVB	Not(AVB)
F	F	F	T
F	T	T	F
T	F	T	F
T	T	T	F

2.

A	B	¬A	¬B	¬A V ¬B
F	F	T	T	T
F	T	T	F	T
T	F	F	T	T
T	T	F	F	F

7) x = AB01 y = C1DAD

x = 1010 1011 0000 0001

y = 1100 0001 1101 1010 1101

1.

AND 0000 1010 1011 0000 0001

1100 0001 1101 1010 1101

= 0000 0000 1001 0000 0001

= 901

2. OR

0000 1010 1011 0000 0001

1100 0001 1101 1010 1101

= 1100 1011 1111 1010 1101

= C B F A D

= CBFAD

x or y

3. x 0000 1010 1011 0000 0001

y 1100 0001 1101 1010 1101

= ~~1100 1011~~

= 1100 1011 0110 1010 1100

= ~~CB6AB~~ CB6AC

8) 1. num1 = B69

= 1011 0110 1001

num2 = 7AD

= 0111 1010 1101

AND 1011 0110 1001

0111 1010 1101

= 0011 0010 1001

= 329$_{16}$

2. num1 OR num2

1010 0110 1001

0111 1010 1101

= 1111 1110 1101

= FED

3. not num1

1010 0110 1001

= 0100 1001 0110

= 496