

Number base conversion and binary² arithmetic

Please try to do these problems yourself. Make note of what you don't understand how to do.

* This form will record your name, please fill your name.

Pituchai Mitpaladee

$$\begin{array}{r} 2 \overline{) 201} \quad 1 \\ 2 \overline{) 100} \quad 0 \\ 2 \overline{) 50} \quad 0 \\ 2 \overline{) 25} \quad 1 \\ 2 \overline{) 12} \quad 0 \\ 2 \overline{) 6} \quad 0 \\ 2 \overline{) 3} \quad 1 \\ 1 \end{array}$$

1. Convert 201 base10 to 8-bit binary
(1 Point)

11001001

2. Convert 201 base10 to base 3 using the division method (5-digit answer ddddd)
(1 Point)

$$\begin{array}{r} 3 \overline{) 201} \quad 2 \\ 3 \overline{) 64} \quad 1 \\ 3 \overline{) 22} \quad 1 \\ 3 \overline{) 7} \quad 1 \\ 2 \end{array}$$

21110

3. Convert 11 1110 0111 binary to hexadecimal
(1 Point)

↪ ฐานสิบหก *

3E7

4. Convert C0FE base16 to binary (answer with space between 4 digits: dddd dddd dddd dddd)

(1 Point)

1100 0000 1111 1110

A = 10	E = 14	C = 12
B = 11	F = 15	
C = 12		
D = 13		
E = 14		
F = 15		

5. Compute 1011 0101 + 0101 1011 in regular binary (not sign-magnitude). Write your answer in 8-bit binary.

(1 Point)

1 0001 0000

$$\begin{array}{r}
 1011 \ 0101 \\
 + 0101 \ 1011 \\
 \hline
 10001 \ 0000
 \end{array}$$

6. Is there overflow in the previous question?

(1 Point)

☒ Yes

☐ No

$$\begin{array}{r}
 01 \\
 0010 \ 1101 \\
 - 0001 \ 0111 \\
 \hline
 10
 \end{array}$$

7. Compute 0010 1101 - 0001 0111 (regular binary) Write your answer in 8-bit binary.

(1 Point)

010110

$$\begin{array}{r}
 2 \overline{) 105} \ 1 \\
 2 \overline{) 52} \ 0 \\
 2 \overline{) 26} \ 0 \\
 2 \overline{) 13} \ 1 \\
 2 \overline{) 6} \ 0 \\
 2 \overline{) 3} \ 1 \\
 \hline
 1
 \end{array}$$

8. Convert 105 base10 to 8-bit binary representation

(1 Point)

100 1011

9. Convert -105 base10 to 8-bit signed magnitude representation
(1 Point)

-1101001

10. Convert -105 base10 to 8-bit 2's complement representation
(1 Point)

110101

2	105	1	1001011	
2	52	0	0110100	1's
2	26	0		
2	13	1	110101	2's
2	6	0		
2	3	1		
	1	1		

$$105 - 7 = 98$$

11. Convert 105 base10 to excess-M representation, (use the lowest possible M)
(1 Point)

lowest = -7?

110011

12. What areas do you think you need more practice on?
(1 Point)

- ☐ base conversion
- ☐ binary arithmetic
- ☒ 2's complement representation
- ☒ excess-M representation
- ☒ signed-magnitude representation

2	98	0
2	49	1
2	24	1
2	12	0
2	6	0
2	3	1
	1	1

