Number base conversion and binary$^{?}$ arithmetic

Please try to do these problems yourself. Make note of what you don't understand how to do.
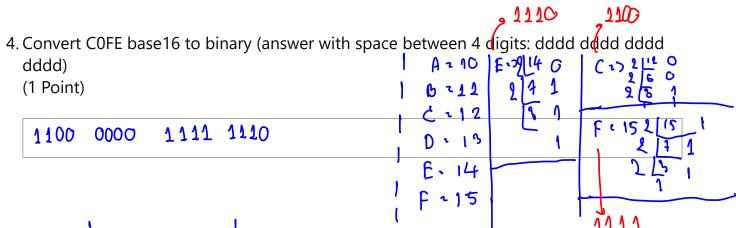
* This form will record your name, please fill your name.

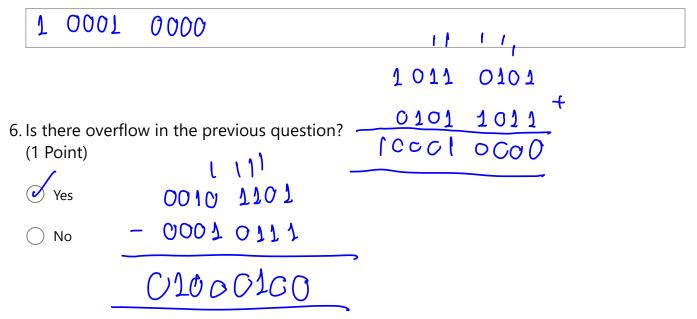Pituchai Mitpaladee

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

1100 1001

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

2 1 1 1 0

ร า ห ร ิ ย ห ก *

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

3 E 7

$0111 = 7$
$1110 = E$ } 3E7
$11 = 3$

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

1100 0000 1111 1110

[handwritten work:]
A = 10   E = 14
B = 11
C = 12
D = 13
E = 14
F = 15
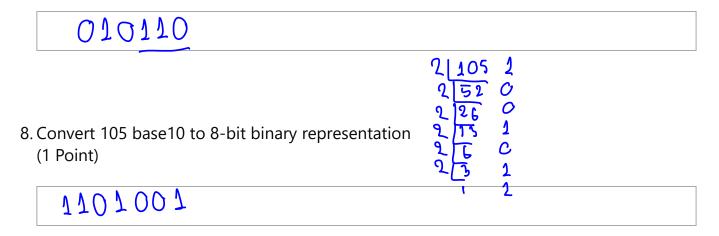
5. Compute 1011 0101 + 0101 1011 in regular binary (not sign-magnitude). Write your answer in 8-bit binary.
(1 Point)

1 0001 0000

[handwritten work:]
1011 0101
0101 1011 +
10001 0000

6. Is there overflow in the previous question?
(1 Point)
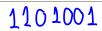
☑ Yes
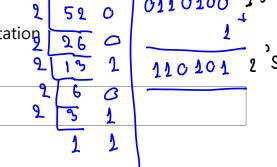○ No

[handwritten work:]
0010 1101
− 0001 0111
0100 0100

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

0010110

8. Convert 105 base10 to 8-bit binary representation
(1 Point)

1101001

[handwritten work:]
2 | 105   1
2 | 52   0
2 | 26   0
2 | 13   1
2 | 6   0
2 | 3   1
      1

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

   11010001

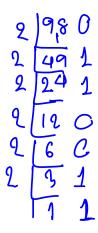10. Convert -105 base10 to 8-bit 2's complement representation
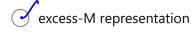   (1 Point)

    1 1 0 1 01

$$2 \overline{|105 \ 1}$$
$$2 \overline{|52 \ 0}$$
$$2 \overline{|26 \ 0}$$
$$2 \overline{|13 \ 1}$$
$$2 \overline{|6 \ 0}$$
$$2 \overline{|3 \ 1}$$
$$1 \ 1$$

$$\begin{array}{l} 1001011 \\ \overline{0110100} \text{ 1's} \\ \quad\quad +1 \\ \overline{1101 01} \text{ 2's} \end{array}$$

$105 - 7 = 98$

11. Convert 105 base10 to excess-M representation, (use the lowest possible M)
    (1 Point)   ↳ lowest = -7? ✱

    1 1 0 0 1 1

$$2 \overline{|98 \ 0}$$
$$2 \overline{|49 \ 1}$$
$$2 \overline{|24 \ 1}$$
$$2 \overline{|12 \ 0}$$
$$2 \overline{|6 \ 0}$$
$$2 \overline{|3 \ 1}$$
$$1 \ 1$$

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

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