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Numbering Systems Quiz   10 / 10

Complete the following problems and fill in the missing values. One mark for each correct answer. You have extra room to show your work. [6]

DECIMAL 6	BINARY	HEXADECIMAL
2^7 2^6 2^5 2^4 2^3 2^2 2^1 2^0 1 1 0 1 0 0 1 1 128+64+32+16+8+4+2+1 211₁₀ ✓	**1 1 0 1 0 0 1 1**	1101 0011 D 3₁₆ ✓
1 0 1 0 1 1 0 1 128+64+32+16+8+4+2+1 173₁₀ ✓	D R / D R 2 0 / 6 1 1 0 / 3 0 0 1 / 1 1 1 0 1 0 1 1 0 1₂ ✓	**A D**₁₆ 10 13
207	D R 103 1 51 1 25 1 12 1 6 0 3 0 1 1 0 1 1 1 0 0 1 1 1 1₂ ✓	1100 1111 8+4+2+1 8+4+2+1 12 15 C F₁₆ ✓

Binary Addition [2 marks]. Assume all binary numbers in this question are unsigned.

2 ✓

```
    1 0 1 0 1 0 1 1 0 1 0 1 0 1
    1 1 0 0 1 1 0 1 1 0 0 1 1 1
    1 0 1 0 1 0 1 1 0 1 0 1 0 1
  + 0 0 1 0 1 0 1 1 0 1 0 1 0 1
  _____
  0 1 0 0 1 0 0 1 1 1 1 1 0 0 1 1 0
```

3. Binary Subtraction [2 marks] Use two's complement to solve. Both numbers are 8-bit signed integers.

2

```
    1 1 1 0 1 0 1 0
  - 0 0 0 1 0 0 1 1
  _____
  1 1 1 0 1 0 1 1 1  ✓
        ↓
  * Only counted 8-bits
    counted
```

Two's Complement

```
    1 1 1 0 1 1 0 0
  +             1
  _____
    1 1 1 0 1 1 0 1   ✓

    1 1 1 0 1 0 1 0
  + 1 1 1 0 1 1 0 1
  _____
  1 1 1 0 1 0 1 1 1
```