


"I pledge my honor that I have abided by the Stevens Honor System." - 

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1. convert following #s to decimal:

(a) 01011001_2

$$0 \times 128 + 1 \times 64 + 0 \times 32 + 1 \times 16 + 1 \times 8 + 0 \times 4 + 0 \times 2 + 1 \times 1 = 89$$

(b) 10111000_2

$$1 \times 128 + 0 \times 64 + 1 \times 32 + 1 \times 16 + 1 \times 8 + 0 \times 4 + 0 \times 2 + 0 \times 1 = 184$$

(c) 11001001_2

$$1 \times 128 + 1 \times 64 + 0 \times 32 + 0 \times 16 + 1 \times 8 + 0 \times 4 + 0 \times 2 + 1 \times 1 = 201$$

2a) $103_{10} = 01100111_2$

$$\begin{array}{r} 2 \overline{) 103} \\ \underline{2 \times 51} \\ 2 \overline{) 25} \\ \underline{2 \times 12} \\ 2 \overline{) 12} \\ \underline{2 \times 6} \\ 2 \overline{) 6} \\ \underline{2 \times 3} \\ 2 \overline{) 3} \\ \underline{2 \times 1} \\ 0 \end{array}$$

(c) $97_{10} = 1100001_2$

$$\begin{array}{r} 2 \overline{) 97} \\ \underline{2 \times 48} \\ 2 \overline{) 49} \\ \underline{2 \times 24} \\ 2 \overline{) 25} \\ \underline{2 \times 12} \\ 2 \overline{) 13} \\ \underline{2 \times 6} \\ 2 \overline{) 7} \\ \underline{2 \times 3} \\ 2 \overline{) 1} \\ \underline{2 \times 0} \\ 1 \end{array}$$

(b) $-28_{10} = 11100100_2$

$$\begin{array}{r} 2 \overline{) 280} \\ \underline{2 \times 140} \\ 2 \overline{) 140} \\ \underline{2 \times 70} \\ 2 \overline{) 70} \\ \underline{2 \times 35} \\ 2 \overline{) 35} \\ \underline{2 \times 17} \\ 2 \overline{) 17} \\ \underline{2 \times 8} \\ 2 \overline{) 9} \\ \underline{2 \times 4} \\ 2 \overline{) 5} \\ \underline{2 \times 2} \\ 1 \end{array}$$

3. an 8bit two's complement the min is 10000000 while max is 01111111

Which in decimal is and respectively covering possible

4a) $83_{10} = 01010011_2$

$$\begin{array}{r} 2 \overline{) 83} \\ \underline{2 \times 41} \\ 2 \overline{) 41} \\ \underline{2 \times 20} \\ 2 \overline{) 21} \\ \underline{2 \times 10} \\ 2 \overline{) 11} \\ \underline{2 \times 5} \\ 2 \overline{) 5} \\ \underline{2 \times 2} \\ 2 \overline{) 3} \\ \underline{2 \times 1} \\ 1 \end{array}$$

(b) $68_{10} = 01000100_2$

$$\begin{array}{r} 2 \overline{) 68} \\ \underline{2 \times 34} \\ 2 \overline{) 34} \\ \underline{2 \times 17} \\ 2 \overline{) 17} \\ \underline{2 \times 8} \\ 2 \overline{) 9} \\ \underline{2 \times 4} \\ 2 \overline{) 5} \\ \underline{2 \times 2} \\ 2 \overline{) 3} \\ \underline{2 \times 1} \\ 1 \end{array}$$

4c) $7_{10} = 00000111_2$

$$\begin{array}{r} 2 \overline{) 7} \\ \underline{2 \times 3} \\ 2 \overline{) 1} \\ \underline{2 \times 0} \\ 1 \end{array}$$

$-7_{10} = 11111001_2$

$$\begin{array}{r} 2 \overline{) 14} \\ \underline{2 \times 7} \\ 2 \overline{) 7} \\ \underline{2 \times 3} \\ 2 \overline{) 1} \\ \underline{2 \times 0} \\ 1 \end{array}$$