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CSCI-21 Quiz #2

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Please use pencil and erase mistakes. No electronic devices of any type. If you need more scratch room, use the back. 10 points.

What are the two primary things that the base of a number system tells you? Illustrate (give an example of) each of these things for base 13. (4 points)

1) It tells you about the set of digits and its cardinality. OK

2) It tells you about the place values for a number expressed in that base which are always powers of 'b'.

Consider base 13:

1) $S = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C\}$, $|S| = 13$ OK

2) 4A5 has place values 13^2 13^1 13^0 .

Convert the following unsigned binary numbers to decimal, octal and hexadecimal (6 points - 1 each):

$$01011001_2 = \underline{89}_{10} = \underline{131}_8 = \underline{59}_{16}$$

128	64	32	16	8	4	2	1	
0	1	0	1	1	0	0	1	
4	2	1	4	2	1	4	2	
0	0	1	0	1	1	0	0	1

64
16
8
1
89

$$01011100_2 = \underline{92}_{10} = \underline{134}_8 = \underline{5C}_{16}$$

128	64	32	16	8	4	2	1	
0	1	0	1	1	1	0	0	
4	2	1	4	2	1	4	2	
0	0	1	0	1	1	1	0	0

2
64
16
8
4
92