John Robertson

jprob

1)

A): (Starting from right): 20+21+0+0+24+25+0+0+28+29 = 1 + 2 + 8 + 32 + 256 + 512 = **(811)10**

B): 512 is a power of two, and is (1000000000)2. 513 is one more than that. **(1000000001)2**

C): Converting to decimal: 5 \* 161 + A \* 160 = **(90)10**

Converting to binary: (5)16 = 0101; (A)16 = 1010; these can be concatenated as **(01011010)2**

2) The expression is (A\*B\*C) + (A\*(~B + ~C))

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A | B | C | ~B + ~C | A\*B\*C | A\*(~B + ~C) | **(A\*B\*C) + (A\*(~B + ~C))** |
| 0 | 0 | 0 | 1 | 0 | 0 | **0** |
| 0 | 0 | 1 | 1 | 0 | 0 | **0** |
| 0 | 1 | 0 | 1 | 0 | 0 | **0** |
| 0 | 1 | 1 | 0 | 0 | 0 | **0** |
| 1 | 0 | 0 | 1 | 0 | 1 | **0** |
| 1 | 0 | 1 | 1 | 0 | 1 | **0** |
| 1 | 1 | 0 | 1 | 0 | 1 | **0** |
| 1 | 1 | 1 | 0 | 1 | 0 | **1** |

3)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A | B | A\*~B | A + B | **(A\*~B)\*(A + B)** |
| 0 | 0 | 0 | 0 | **0** |
| 0 | 1 | 0 | 1 | **0** |
| 1 | 0 | 1 | 1 | **1** |
| 1 | 1 | 0 | 1 | **0** |

4) F= A + ~A\*B + B~A + C~B = 1 + 0\*0 + 0\*0 + 1\*1 = 1 + 0 + 0 + 1 = **1**