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PART A:

1. 255.375

2	255	1
2	127	1
2	63	1
2	31	1
2	15	1
2	7	1
2	3	1
	1	

$255.375_{10} = 11111111.110_2$

16	255	15
	15	

FF_{16}

$255.375_{10} = FF.6C8_{16}$

0.375×16
$= 6$
0.75×16
$= 12$ C
$0.5 \times 16 = 8$

Fractional part

.101

$(1 \times 2^{-1}) + (0 \times 2^{-2}) + (1 \times 2^{-3})$

$\frac{1}{2} + \frac{1}{8}$ $\quad 0.5 + 0.125$

$= 0.625$

110101

$1 \times 2^0 + 0 \times 2^1 + 1 \times 2^2 + 0 \times 2^3 + 1 \times 2^4 + 1 \times 2^5$

$1 + 4 + 16 + 32 = 53$

$(53.625)_{10}$

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3. If we get remainder when 2/3 = -1 and if we get the sum of remainders as zero then it is divisible by 3

1

100 111

$1\times2^0 + 1\times2^1 + 1\times2^2 + 0\times2^3 + 0\times2^4 + 1\times2^5$

$1 - 1 + 1 + 0 + 0 - 1$

$= 0$

∴ It is divisible by 3

4.

2	25	1
2	12	0
2	6	0
2	3	1
	1	

$25_{10} = (11001)_2$

~~complement~~

00110

00111

00011001

$(111\ 00110)_2$

$-25 = 11100111$

5. $F = (A+B)(A'+C)(B+C')$

$= AA' + AC + BA' + BC\ (B+C')$

$AA' \rightarrow 0$

$= AC + BA' + BC\ (B+C')$

$= ACB + BA'B + BCB + ACC' + BA'C + BCC'$

$ACC' \rightarrow 0$, $BCC' \rightarrow 0$

$= ACB + BA' + BC + BA'C$

$= BA' + BC$ (Absorption law)