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CIS 314 Assignment 2

2a) 0×00000066

0000 0000 ~ 1100 0110
 $2^8 2^7 2^6 2^5 2^4 2^3 2^2 2^1$

$128 + 64 + 4 + 2 = 198$

b) $0 \times \text{FFFFEC6}$

1111 1111 1111 1111 1110 1100 0110
 $2^31 2^30 2^29 2^28 2^27 2^26 2^25 2^24 2^23 2^22 2^21 2^20 2^19 2^18 2^17 2^16 2^15 2^14 2^13 2^12 2^11 2^10 2^9 2^8 2^7 2^6 2^5 2^4 2^3 2^2 2^1$

$-2^{31} + 2^{30} + 2^{29} + \dots + 2^9 + 2^7 + 2^6 + 2^2 + 2^1 = -314$

c) $0 \times \text{FFFFFFFF}$

1111 1111 ~ 1111

$-2^{31} + 2^{30} + 2^{29} + \dots + 2^2 + 2^1 + 2^0 = -1$

5a) 0×80000000

1000 0000 ~ 0000

5 E(0000) $n = 0$ $-1 \cdot 0 \cdot 0$

$-1 \cdot 2^E \cdot (1 + M)$

$= -0$
 0

b) $0 \times 439D0000$

0100 0011 1001 1101 0000 ~

$2^7 + 2^3 + 2^4 + 2^0$

$128 + 4 + 2 + 1 = 135$

$135 - 127 = 8$

$0 \times \frac{1}{2} + 0 \times \frac{1}{4} + 1 \times \frac{1}{8} + 1 \times \frac{1}{16} + 1 \times \frac{1}{32} + 0 \times \frac{1}{64} + 1 \times \frac{1}{128}$
 $\frac{1}{8} + \frac{1}{16} + \frac{1}{32} + \frac{1}{128} = 0.2265625$

$-1 \cdot 2^8 \cdot (1 + 0.2265625) = 314$

c) $0 \times C1340000$

1100 0001 0011 0100 0000 ~

$2^7 + 2^1 = 128 + 2 = 130$

$130 - 127 = 3$

$M = [0 \times \frac{1}{2} + 1 \times \frac{1}{4} + 1 \times \frac{1}{8} + 0 \times \frac{1}{16} + 1 \times \frac{1}{32}]$
 $\frac{1}{4} + \frac{1}{8} + \frac{1}{32} = 0.40625$

$-1 \cdot 2^3 \cdot (1 + 0.40625) = -11.25$

$$-1 \cdot 2 \cdot (1 + M)$$

~~$2 \times 2 + 0 + 0 + 0 + 0 + 0$~~

0 1 1 1 1 1 1 1

B	F	8	0	0	0	0	0
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b) 16.75 $16 = 00010000$

$$0.50 \times 2 = 1 \quad 1 \text{ (No remainder)}$$

$$16.75_{10} = 1000.11_2$$

10202.11

$$1.000011 \times 2^4 = E \quad M = 000011$$

$$21 + 127 = 131 = 10000011 = F$$

4 1 8 6 0 0 0 0

0x41860000

c) -314.0 $314 = 100111010$

512

100111010

$$2^9 \times 0 + 2^8 + 2^7 \times 0 + 2^6 \times 0$$

$$1.00111010 \times 2^8 = E \quad M = 00111010$$

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

$$8 + 127 = 135 \quad 10000111$$

135 $2^{17} \times 1 + 0 + 0 + 0 + 0 + 1 + 1$

1100 0011 1001 1101 0000 0000 0000 0000

2 3 9 0 0 0 0 0

0xC39D0000