a) 49.1875

$49 \% 16 = 3 \; R \; 1$

$3 \% 16 = 0 \; R \; 3$

$0.1875 \times 16 = 3.0$

$\rightarrow 49.1875_{10} = 31.3_{16}$

$\qquad = 110001.0011_2$

$\qquad = 61.14_8$

110001.0011×2^0

$\qquad = 0.1100010011 \times 2^6$

$01100010 | 01100000 | 00000000 | 00000110$

$\quad 6 \qquad 2 \qquad 6 \qquad 0 \qquad 0 \; 0 \qquad 0 \; 6$

b) 3.07421875

$3/16 = 0 \; R \; 3$

$0.07421875 \times 16 = 1.1875$

$0.1875 \times 16 = 3.0$

$3.07421875_{10} = 3.13_{16}$

$\qquad = 11.00010011_2$

$\qquad = 3.046_8$

$11.00010011 \times 2^0 = 0.1100010011 \times 2^2$

$01100010 | 01100000 | 00000000 | 00000010$

$\quad 6 \qquad 2 \qquad 6 \qquad 0 \qquad 0 \qquad 0 \qquad 0 \; 2$

0.2

$0.2 \times 16 = 3.2$
$0.2 \times 16 = 3.2$
$=$

$0.2_{10} = 0.33_{16}$

$= 0.0011_2 = 0.00110011001100110011 = 0.1100 \times 10^{-2}$

$= 0.1463_8$

0 1 1 0 0 1 1 0 | 0 1 1 0 0 1 1 0 | 0 1 1 0 0 1 1 0 | 1 1 1 1 1 1 1 0

6   6   6   6   6   6   F   E

b) -49.1875

0 1 1 0 0 0 1 0 | 0 1 1 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 1 1 0   1st comp
1 0 0 1 1 1 0 1 | 1 0 0 1 1 1 1 1 | 1 1 1 1 1 1 1 1 | 0 0 0 0 0 1 1 0   2nd comp
                              + 1

1 0 0 1 1 1 0 1 | 1 0 1 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 1 1 0

9 D A 0 0 0 0 6

-3.07421875

0 1 1 0 0 0 1 0 | 0 1 1 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 1 0
1 0 0 1 1 1 0 1 | 1 0 0 1 1 1 1 1 | 1 1 1 1 1 1 1 1 | 0 0 0 0 0 0 1 0
                              + 1

1 0 0 1 1 1 0 1 | 1 0 1 0 0 0 0 0 | 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 1 0

9 D A 0 0 0 0 2

$\boxed{0.2}$

01100110|01100110|01100110|1111 1110

10011001|10011001|1001 1001|1111 1110

$\overset{+1}{}$

10011001|10011001|10011001|1001 1010|1111 1110

$\underbrace{}_{9}\underbrace{}_{9}\underbrace{}_{9}\underbrace{}_{9}\underbrace{}_{9}\underbrace{}_{A}\underbrace{}_{F}\underbrace{}_{E}$

c) 69999902

01101001|10011001|10011001|00000010

$\rightarrow 0.110100\underline{1} \times 10^2$

$\rightarrow 11.0100\underline{1}_2 = 3.4\underline{C}_{16}$

$3_{16} = 3 \times 16^0 = 3_{10}$

$0.4C_{16} = \dfrac{4}{16} + \dfrac{12}{16^2} + \dfrac{12}{16^3} + \dfrac{12}{16^4} + \cdots$

$\qquad = \dfrac{1}{4} + \dfrac{12}{16^2}\left(1 + \dfrac{1}{16} + \dfrac{1}{16^2} + \cdots\right)$

$\qquad = \dfrac{1}{4} + \dfrac{3}{64} \cdot \dfrac{16}{15}$

$\qquad = \dfrac{3}{10} = 0.3$

$\rightarrow 69999902 = 11.0100\underline{1}_2 = 3.4C_{16} = \boxed{3.3_{10}}$

$\boxed{69999903}$

01101001 | 10011001 | 10011001 | 00000011

$\Rightarrow 0.110\underline{1001} \times 2^3$

$\Rightarrow 110.\underline{1001}_2 = 6.\underline{9}_{16}$

$6_{16} = 6 \times 16^0 = 6_{10}$

$0.\underline{9}_{16} = \dfrac{9}{16} + \dfrac{9}{16^2} + \dfrac{9}{16^3} + \dfrac{9}{16^4} + \dots$

$\qquad = \dfrac{9}{16}\left(1 + \dfrac{1}{16} + \dfrac{1}{16^2} + \dfrac{1}{16^3} + \dots\right)$

$\qquad = \dfrac{9}{16} \cdot \dfrac{16}{15}$

$\qquad = \dfrac{3}{5} = 0.6$

$\Rightarrow 69999903 = 110.1001_2 = 6.9_{16} = 6.6_{10}$

$\boxed{966667FF}$

10010110 | 01100110 | 01100111 | 11111111
$\qquad\qquad\qquad\quad -1 \qquad\qquad\quad -1$
10010110 | 01100110 | 01100110 | 11111110

0110 1001 1100 1100 1100 1100 0000 0001

$\Rightarrow 0.110\underline{1001} \times 2^1$

$\Rightarrow 1.10\underline{1001}_2 \Rightarrow 1.A\underline{6}_{16}$

$1_{16} = 1 \times 16^0 = 1_{10}$

$0.A6_{16} = \dfrac{10}{16} + \dfrac{6}{16^2}\left(1 + \dfrac{1}{16} + \dfrac{1}{16^2} + \dots\right) = \dfrac{10}{16} + \dfrac{6}{16^2}\cdot\dfrac{16}{15} = 0.65$

$\Rightarrow 966667FF$

$= -1.65_{10}$