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Option 2)

a) $121 : 2 = 60 \rightarrow \text{remainder } 1$

$60 : 2 = 30 \rightarrow "$ 0

$30 : 2 = 15 \rightarrow "$ 0

$15 : 2 = 7 \rightarrow "$ 1

$7 : 2 = 3 \rightarrow "$ 1

$3 : 2 = 1 \rightarrow "$ 1

$1 : 1 = 1 \rightarrow "$ 1

binary rep. is 1111001

$\frac{113}{1024} \cdot 2 = \frac{226}{1024} \rightarrow 0$

$\frac{226}{1024} \cdot 2 = \frac{452}{1024} \rightarrow 0$

$\frac{452}{1024} \cdot 2 = \frac{904}{1024} \rightarrow 0$

$\frac{904}{1024} \cdot 2 = \frac{1808}{1024} \rightarrow 1$

$\frac{1808}{1024} - 1 = \frac{784}{1024} \cdot 2 = \frac{1568}{1024} \rightarrow 1$

(cont.)

$$\frac{1568}{1024} - 1 = \frac{544}{1024} \cdot 2 = \frac{1088}{1024} \rightarrow 1$$

$$\frac{128}{1024} \rightarrow 0$$

$$\frac{256}{1024} \rightarrow 0$$

$$\frac{512}{1024} \rightarrow 0$$

$$\frac{1024}{1024} = 1$$

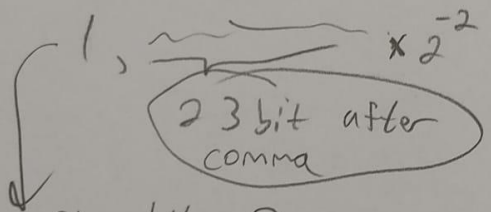
$$\left(\frac{113}{1024} \right)_{10} = (0,0001110001)_2$$

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b) $\frac{2}{7} = 0,0100 \dots$

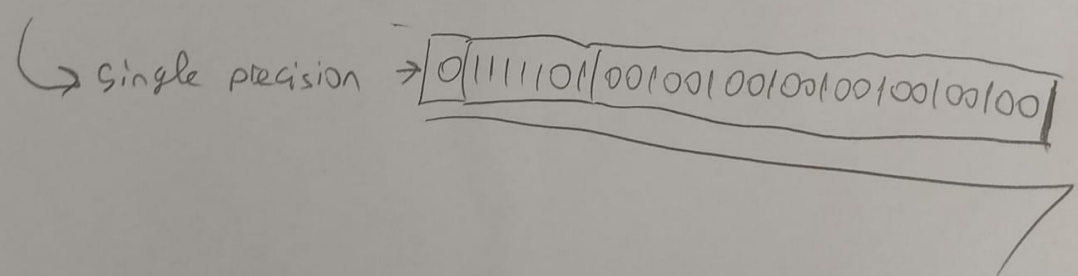


sign bit = 0

$e - 127 = -2$

$e = 125 = (1111101)_2$

frac = 00100100100100100100100100



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c) first digit = 1 (number is neg.)

after eight bit = 00011101 $\rightarrow 29$ ($29 - 127 = -98$)

frac. $\rightarrow 011100$ $\frac{\text{all 200}}{2^{98}}$

$\rightarrow -1, (1.0111), 2^{-98}$

$\rightarrow -1, 10111, 2^{-4} \cdot 2^{-98}$

$\rightarrow -1, 23, 2^{-112}$

$\rightarrow -23, 2^{-112}$

$$\frac{1568}{1024} - 1 = \frac{544}{1} \cdot 2 = 1088$$

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Q2) option 1

for 1: 2, 5

for 2: 3, 4, 5

for 3: 1, 4, 5, 6

for 4: 1

for 5: 1, 2, 3, 4, 6

for 6: 4, 5
