1) 1) 5.75

Whole 5 ⇒ 16 8 4 2 1
4 + 1 ⇒ 0 1 0 1 ⇒

fraction

0,75 · 2 = 1,5 ⇒ 1
0,5 · 2 = 1

} 0,75 = 0.11

combining ⇒ 101.11

2) 63/64 ⇒ 64 ⇒ 2^6 ⇒ 6 bit

means all 6

therefore ⇒ 0.111111

3) 9.8125

Whole ⇒ 9

16 8 4 2 1
0 0 0 0 0
1 1
8 + 1 = 9 ⇒ 1001

fraction

0,8125 · 2 = 1,625 ⇒ 1
0,625 · 2 = 1,25 ⇒ 1
0,25 · 2 = 0,5 ⇒ 0
0,5 · 2 = 1 ⇒ 1

} 0,8125 = 1101

Combining ⇒ 1001.1101

2) 34,890625

Whole ⇒ 34

64 32 16 8 4 2 1
0 0 0 0 0 0 0
1 1
32 + 2 = 34 ⇒ 100010

fraction

0,890625 · 2 = 1,78125 ⇒ 1
0,78125 · 2 = 1,5625 ⇒ 1
0,5625 · 2 = 1,125 ⇒ 1
0,125 · 2 = 0,25 ⇒ 0
0,25 · 2 = 0,5 ⇒ 0
0,5 · 2 = 1 ⇒ 1

} 0,890625 = .111001

Combining ⇒ 100010.111001

Continue

single persisie 1 sign bit

7 - exponent bit

24 - mantisa bit

Push mantisa to the left until first 1 reaches

normalized mantisa → 1 at least exponent.

34.890625 = 100010.111001

then pushed → $1.00010111001 \cdot 2^{+5}$

$5 + 127 = 132 = 10000100$

for positive

Ex Mantisa

0 10000100 00010111001 ... 0

3) 0 01111011 000...0 → 0 Means Normalized Number

sign positive $64+32+16+8+2+1 = 123 \Rightarrow -127$

$123 - 127 = -4 \Rightarrow 2^{-4}$

$2^{-4} \Rightarrow 1 \cdot 2^{-4} = 1/16 = 0,0625$

(mantisa = 0 that means nothing to add.)

4) → The largest denormalized number

0 for positive

5 bits exponent. has to be 0 in order be the largest.

$\Rightarrow 2^{-14} \Rightarrow 00000$

-14

rest Mantisa has to be all 1 in order to b the largest

11111111111

Combining → 0 | 00000 | 1111111111

2^{-14} × $1 - 2^{-10} \Rightarrow 1 - \frac{1}{1024}$

→ Smallest Normalized number

0 for positive

00001 → because of normalized number smallest 1 is

~~Mantiza~~ Mantiza should be all 0 in order to be the smallest

0 00001 0000000000

2^{-14} × $1 - 2^{0} = 1$