

$$45. 1.5 \times 2^{-143} = 1.5 / 2^{143} \approx 1.5 \times 1.19 \times 10^{-43} \approx 1.7 \times 10^{-43}$$

1.5×2^{-143} can be represented as subnormal

$$1.5 = 1 + 0.5 = 1 + 2^{-1}$$

$$1.5 \times 2^{-143} = 1.1 \times 2^{-143}$$

$$1.1 \times 2^{-143} \div 2^{-126} = 1.1 \times 2^{-17} = 1.5 \times 2^{-17}$$

$$1.5 \times 2^{-17} = (1 + 0.5) \times 2^{-17} = 2^{-17} + 2^{-18}$$

$$\text{bit 6} \quad \text{bit 5} = 1$$

$$\begin{array}{c} 22 \quad 7 \quad 4-0 \\ 0 \rightarrow 110 \rightarrow \end{array}$$

Sign: 0

Exponent: 00000000

Fraction: 0 $\xrightarrow{16 \text{ '0's}}$ 0110 $\xrightarrow{8 \text{ '0's}}$ 0

0000 0000 0000 0000 0000 0110 0000 0000

0 0 0 0 0 6 0 6

0x00000060

$$46. \text{C059000000000000}$$

64 bit: Sign: 1 bit, Exponent: 11 bit, Fraction: 52 bit, 1023 (bits)

C059000000000000

C = 1100, 0 = 0000, 5 = 0101, 9 = 1001, 0 \rightarrow

Sign bit: 1 (negative), Exponent: 10000000101, Fraction: 1001 \rightarrow 0

10000000101: $1 \times 2^{10} + 1 \times 2^9 + 1 \times 2^0 = 1029$ Actual exponent $1029 - 1023 = 6$

Fraction: 1.1001 \rightarrow

Decimal value = $-1 \times 1.1001 \times 2^6$

$$1.1001 = 1 + 2^{-1} + 2^{-4} = 1 + 0.5 + 0.0625 = 1.5625$$

$$1.5625 \times 2^6 = 100.0$$

Negative: $\boxed{-100}$