3.9 $-105 - 42 = -128\ (-147)$

3.10 $-105 + 42 = -63$

3.11 $151 + 214 = 255\ (365)$

3.13 62×12

3.13 62×12

$(62)_{16} = (0110\_0010)_2$

$(12)_{16} = (0001\_0010)_2$

Iteration	Step	Multiplier $(12)_{16}$	Multiplicand $(62)_{16}$	Product
0	Initial values	0000_0000_0001_0010	0000_0000_0110_0010	0000_0000_0000_0000
1	1: 0 → no operation	0000_0000_0001_0010	0000_0000_0110_0010	0000_0000_0000_0000
	2: Shift left Multiplicand	0000_0000_0001_0010	0000_0000_1100_0100	0000_0000_0000_0000
	3: Shift right Multiplier	0000_0000_0000_1001	0000_0000_1100_0100	0000_0000_0000_0000
2	1: 1 → Prod = Prod + Mcand	0000_0000_0000_1001	0000_0000_1100_0100	0000_0000_0000_0000 + 0000_0000_1100_0100 0000_0000_1100_0100
	2: Shift left Multiplicand	0000_0000_0000_1001	0000_0001_1000_1000	0000_0000_1100_0100
	3: Shift right Multiplier	0000_0000_0000_0100	0000_0001_1000_1000	0000_0000_1100_0100
3	1: 0 → no operation	0000_0000_0000_0100	0000_0001_1000_1000	0000_0000_1100_0100
	2: Shift left Multiplicand	0000_0000_0000_0100	0000_0011_0001_0000	0000_0000_1100_0100
	3: Shift right Multiplier	0000_0000_0000_0010	0000_0011_0001_0000	0000_0000_1100_0100
4	1: 0 → no operation	0000_0000_0000_0010	0000_0011_0001_0000	0000_0000_1100_0100
	2: Shift left Multiplicand	0000_0000_0000_0010	0000_0110_0010_0000	0000_0000_1100_0100
	3: Shift right Multiplier	0000_0000_0000_0001	0000_0110_0010_0000	0000_0000_1100_0100
5	1: 1 → Prod = Prod + Mcand	0000_0000_0000_0001	0000_0110_0010_0000	0000_0000_1100_0100 + 0000_0110_0010_0000 0000_0110_1110_0100
	2: Shift left Multiplicand	0000_0000_0000_0001	0000_1100_0100_0000	0000_0110_1110_0100
	3: Shift right Multiplier	0000_0000_0000_0000	0000_1100_0100_0000	0000_0110_1110_0100
6~8	1: 0 → no operation 2: Shift left Multiplicand 3: Shift right Multiplier	剩下的怎麼移，LSB都是0	省略	**0000_0110_1110_0100**

得$(06E4)_{16}$

$= (1764)_{10}$

3.22

$0\times0C000000 = 0000\ 1100\ 0000\ 0000\ 0000\ 0000\ 0000\ 0000$

$= 0\ 0001\ 1000\ 0000\ 0000\ 0000\ 0000\ 0000\ 000$

sign is positive

$\exp = 0\times18 = 24 - 127 = -103$

there is a hidden 1

mantissa = 0

answer $= 1.0 \times 2^{-103}$

3.23 $63.25 \times 10^0 = 111111.01 \times 2^0$

normalize, move binary point 5 to the left

1.1111101×2^5

sign = positive, exp = 127+5=132

Final bit pattern: 0 1000 0100 1111 1010 0000 0000 0000 000

= 0100 0010 0111 1101 0000 0000 0000 0000 = 0x427D0000

3.27 $-1.5625 \times 10^{-1} = -.15625 \times 10^0$

$= -.00101 \times 2^0$

move the binary point 3 to the right, $= -1.01 \times 2^{-3}$

exponent $= -3 = -3+15 = 12$, fraction $= -.0100000000$

answer: 1011000100000000

3.35

(A) $3.41796875\times 10^{-3} = 1.1100000000 \times 2^{-9}$

(B) $6.34765625\times 10^{-3} = 1.1010000000 \times 2^{-8}$

(C) $1.05625\times 10^{2} = 1.1010011010 \times 2^{6}$

A×B: EXP = -9 + -8 = -17

=>Underflow

3.36

(A) $3.41796875 \times 10^{-3} = 1.1100000000 \times 2^{-9}$

(B) $6.34765625 \times 10^{-3} = 1.1010000000 \times 2^{-8}$

(C) $1.05625 \times 10^{2} = 1.1010011010 \times 2^{6}$

B× C: EXP = -8 + 6 = -2

1.0001000000 × 1.1010011010 = 10.10101110100100000000

=> $1.0101011101001 \times 2^{-1}$

=> Guard = 0, Round = 0, Sticky = 1

=> Ans = $1.0101011101 \times 2^{-1}$

Ans × A: Exp = -1 - 9 = -10

1.0101011101 × 1.1100000000 = 10.010110001011

=> $1.0010110001011 \times 2^{-9}$

=>Guard = 0, Round = 1, Sticky = 1

=>Final Ans = $1.0010110001 \times 2^{-9}$

3.37

No,
3.35 A*B is underflow => can’t represent
3.36 A*(B*C) = 1.0010110001*2^(-9)