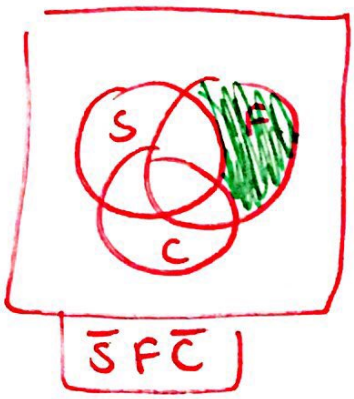
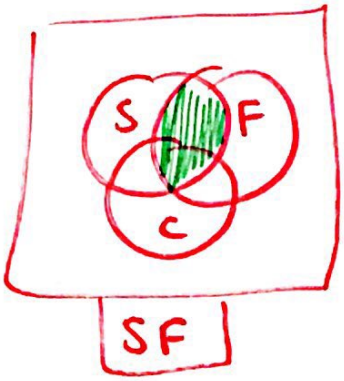
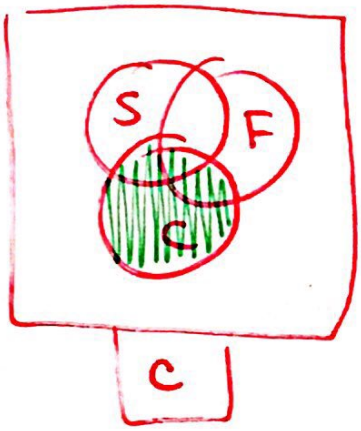
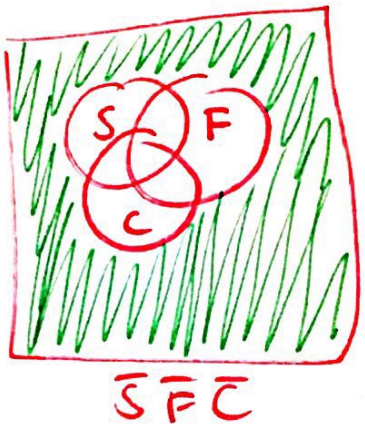
SUMMER 2019 FINAL SOLUTION

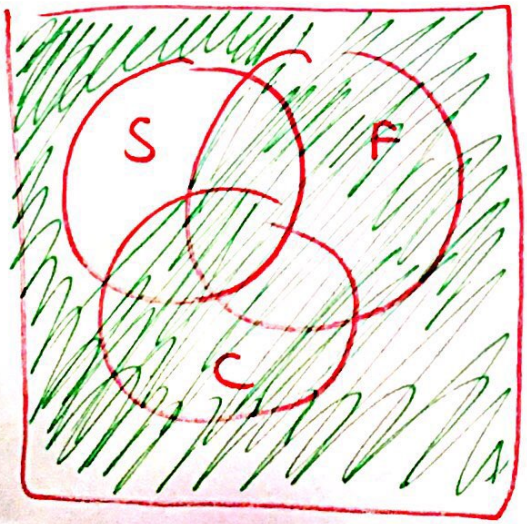
(1)









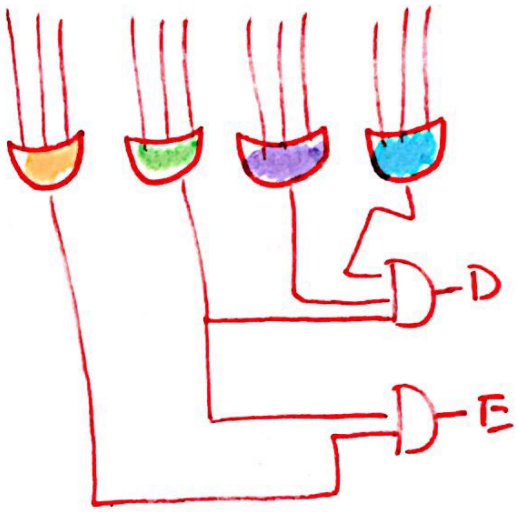


$\bar{S}F\bar{C} + SF + C + \bar{S}\bar{F}\bar{C}$

$= \overline{S\bar{F}\bar{C}}$

(2)

A	B	C	D	E
0	0	0	1	0
0	0	1	1	1
0	1	0	1	1
0	1	1	0	1
1	0	0	1	1
1	0	1	1	1
1	1	0	0	0
1	1	1	0	1



$$D = (\bar{A} + \bar{B} + C)(A + \bar{B} + \bar{C})(\bar{A} + \bar{B} + \bar{C})$$

$$E = (A + B + C)(\bar{A} + \bar{B} + C)$$

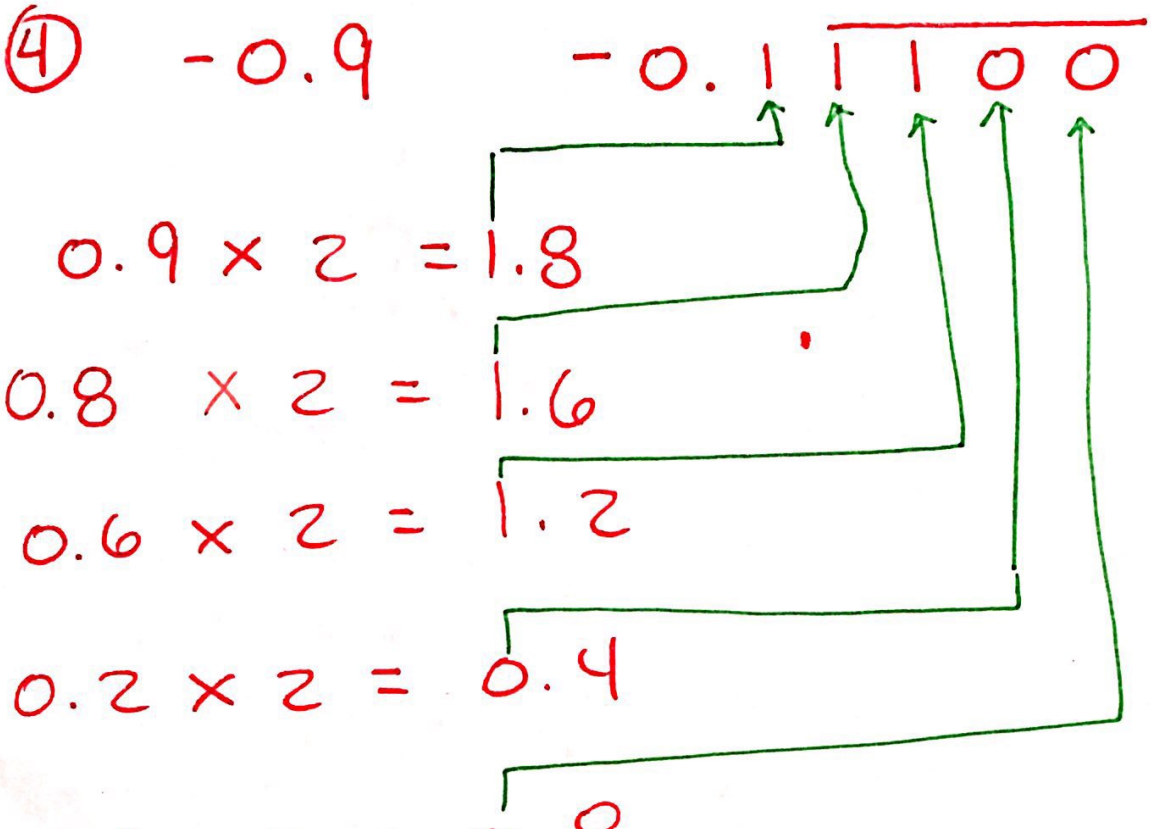
} POS

$$D = \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + \bar{A}B\bar{C} + A\bar{B}\bar{C} + A\bar{B}C$$

$$E = \bar{A}\bar{B}C + \bar{A}B\bar{C} + \bar{A}BC + A\bar{B}\bar{C} + A\bar{B}C + ABC$$

} SOP

④ -0.9 $-0.1\overline{1100}$ Ⓐ



Ⓑ $-0.1\overline{1100} = -1.\overline{1100} \times 2^{-1}$

Ⓒ $= -1.1100110011001100110011\overline{0} \times 2^{-1}$

sign — mantissa

$-1+127 = 126$ ← exp

sign : 1

exp: 01111110

mantissa: 11001100110011001100110

(5)

1	0 1 1	1 1 1 1	0	1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0	0 1 1 0
	B	F		6	6	6	6	6	6

0xBF666666

$8 = $t0 ↓ ← $3 = $v1

⑥ LB $8 7($3)

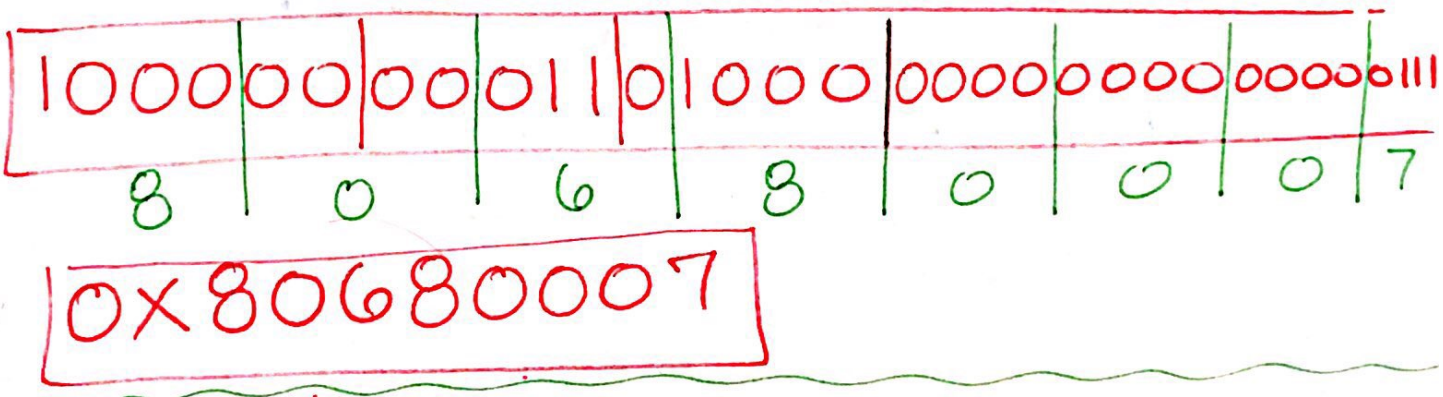
↑ RT ↑ Immed ↑ RS

OP: 0x20

RS: 0x03

RT: 0x08

Immed: 0x0007



0x80680007

Datapath

11 0x08

12 0x0007

14 0x10010000

15 0x10010000

16 0x00000007

*17 0x0000001C

19 0x00000007

20 0x10010b07

*0x07 = 00000111

00000111 << 2 = 00011100 = 0x1C