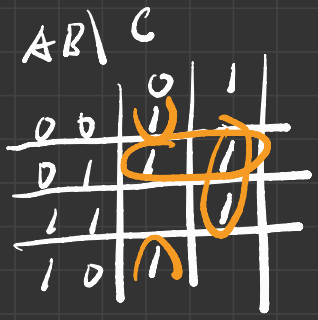
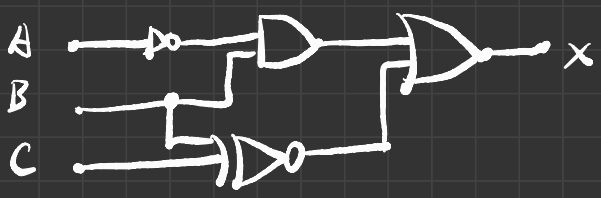
4-4

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



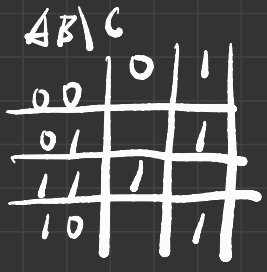
$$\bar{B}\bar{C} + \bar{A}B + BC = \bar{A}B + \overline{B \oplus C}$$



4-5

A	B	C
0	0	0
0	0	1
0	1	0
0	1	1
1	0	0
1	0	1
1	1	0
1	1	1

$$X = \bar{A}BC + A\bar{B}C + AB\bar{C}$$



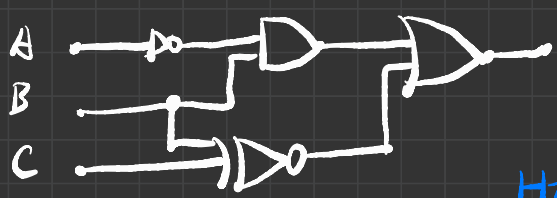
4-6

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

$$X = \bar{A}BC\bar{D} + \bar{A}BCD + A\bar{B}C\bar{D} + AB\bar{C}D + ABC\bar{D} + ABCD$$

$$X = \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}\bar{D} + ABC + ABD$$

4-9.



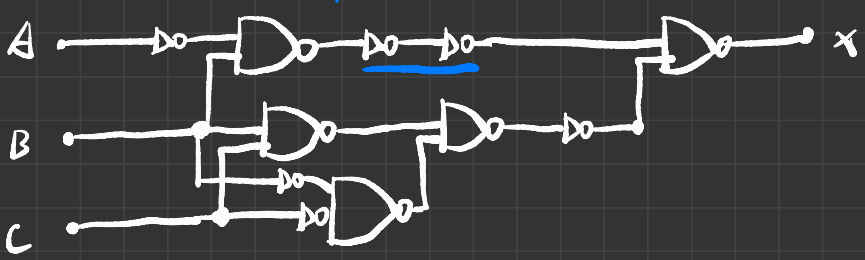
TO NAND

Hint: $\overline{A+B} = \overline{A} \cdot \overline{B}$

$\overline{\overline{AB}}$

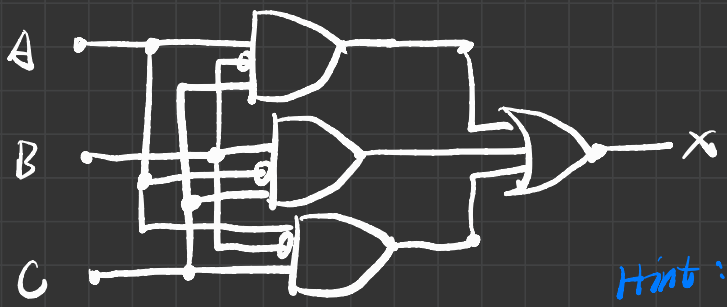
$\overline{\overline{A}\overline{B} + AB} = \overline{\overline{AB}} \cdot \overline{\overline{AB}}$

You can eliminate the double convertor.



4-10

$X = \bar{A}BC + A\bar{B}C + AB\bar{C}$



Hint: $\overline{A+B+C} = \overline{\bar{A} \cdot \bar{B} \cdot \bar{C}}$

can be eliminate.