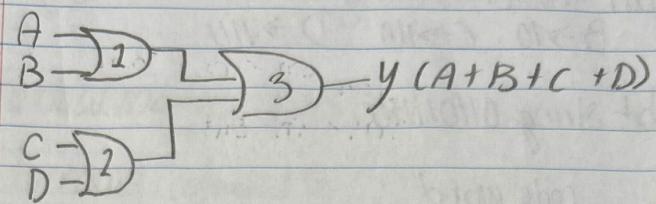


Using minimum 3g gates



Truth table

	A	B	C	D	$Y = A + B + C + D$
1	0	0	0	0	0
2	0	0	0	1	1
3	0	0	1	1	1
4	0	1	1	1	1
5	0	1	1	0	1
6	0	1	0	0	1
7	0	1	0	1	1
8	1	0	0	0	1
9	1	0	0	1	1
10	1	0	1	1	1
11	1	1	0	0	1
12	1	1	0	1	1
13	1	0	1	0	1
14	1	0	0	1	1
15	1	1	1	0	1
16	1	1	1	1	1

$$10) A \cdot (B + \bar{A} \cdot C) + A \cdot C$$

$\rightarrow +$ is or, so that means one of them is 1
• is and, both have to be 1

① distribute A in the first term

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

\rightarrow use complement rule: $A\bar{A} = 0$

$$AB + A\bar{A}C = AB + 0 = AB$$

$$\text{Sub back into } f: F = (AB) + AB + AC$$

Idempotent law: $X + X = X$

$$AB + AB = AB$$

$$F \text{ becomes: } F = AB + AC$$

$$\text{Factor out A: } F = A(B + C)$$

11. A. minimal sum of products

B. minimal product of sums

		AB	CD			
		00	01	11	10	for ABCD
AB	00	1	0	1	1	there are $2^4 = 16$ combos
	01	1	1	1	0	
	11	1	0	0	1	
	10	1	1	1	1	

To find the miniterm #: $8A + 9B + 2C + 1D$

miniterms (convert each to decimal)