

From Chapter 2 Exercises:

2.6 c: $Y = \overline{A}BC + AB$

(c)

$$\begin{aligned} Y &= \overline{A}BC + AB\overline{C} + ABC \\ &= \overline{A}BC + AB(C + \overline{C}) \\ &= \overline{A}BC + AB(1) \\ Y &= \overline{A}BC + AB \end{aligned}$$

2.6 d: $Y = \overline{B}D + \overline{A}C$

(d)

$$\begin{aligned} Y &= \overline{A}\overline{B}\overline{C}\overline{D} + \overline{A}\overline{B}C\overline{D} + \overline{A}B\overline{C}\overline{D} + \overline{A}BC\overline{D} + \overline{A}B\overline{C}D + \overline{A}B\overline{C}\overline{D} + A\overline{B}\overline{C}\overline{D} + A\overline{B}C\overline{D} \\ &= \overline{A}\overline{B}\overline{C}\overline{D} + \overline{A}\overline{B}C\overline{D} + \overline{A}B\overline{C}\overline{D} + \overline{A}BC\overline{D} + \overline{A}B\overline{C}D + \overline{A}B\overline{C}\overline{D} + A\overline{B}\overline{C}\overline{D} + A\overline{B}C\overline{D} \\ &= \overline{A}\overline{B}\overline{D}(C + \overline{C}) + \overline{A}\overline{B}C(D + \overline{D}) + \overline{A}BC(D + \overline{D}) + A\overline{B}\overline{D}(C + \overline{C}) \\ &= \overline{A}\overline{B}\overline{D}(1) + \overline{A}\overline{B}C(1) + \overline{A}BC(1) + A\overline{B}\overline{D}(1) \\ &= \overline{A}\overline{B}\overline{D} + \overline{A}\overline{B}C + \overline{A}BC + A\overline{B}\overline{D} \\ &= \overline{B}\overline{D}(A + \overline{A}) + \overline{A}C(B + \overline{B}) \\ &= \overline{B}\overline{D}(1) + \overline{A}C(1) \\ &= \overline{B}\overline{D} + \overline{A}C \end{aligned}$$

(c)

C \ AB	AB			
	00	01	11	10
0	0	0	1	0
1	1	0	1	0

$$Y = AB + \overline{A}\overline{B}C$$

(d)

CD \ AB	AB			
	00	01	11	10
00	1	0	0	1
01	0	0	0	0
11	1	1	0	0
10	1	1	0	1

$$\begin{aligned} Y &= \overline{A}C + \overline{B}\overline{C}\overline{D} + \overline{B}C\overline{D} \\ &= \overline{A}C + \overline{B}\overline{D}(C + \overline{C}) \\ &= \overline{A}C + \overline{B}\overline{D}(1) \end{aligned}$$

$$Y = \overline{A}C + \overline{B}\overline{D}$$

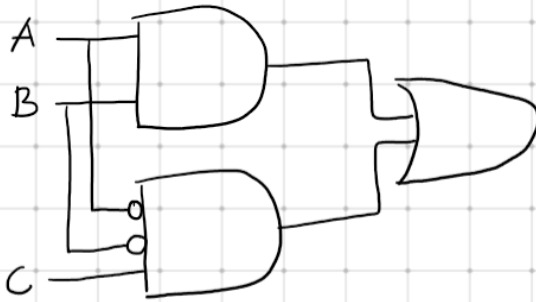
TB: Distributivity

TS: complements

TI: Identity

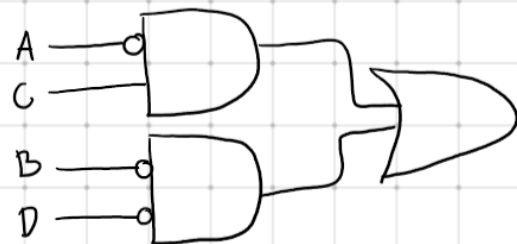
2.8 c

(c)



2.8 d

(d)



2.14 a: $Y = \bar{A}B$

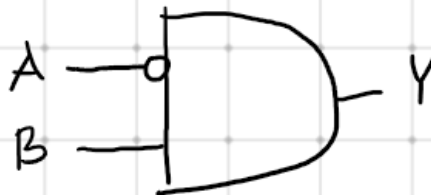
(a)

$$\begin{aligned}
 Y &= \bar{A}BC + \bar{A}B\bar{C} \\
 &= \bar{A}B(C + \bar{C}) \\
 &= \bar{A}B(1) \\
 &= \bar{A}B
 \end{aligned}$$

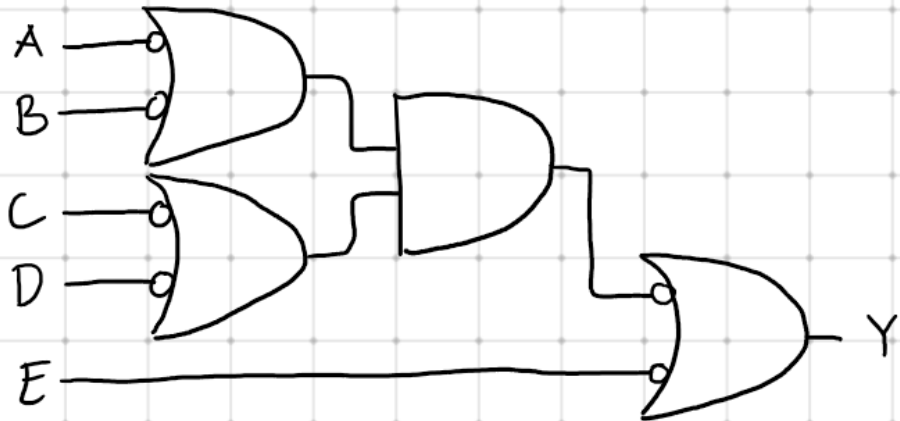
		AB			
		00	01	11	10
C	0	0	1	0	0
	1	0	1	0	0

2.16 a

(a)



2.26



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

2.28

Y

		AB			
CD	00	00	01	11	10
	00	X	0	1	1
	01	X	X	1	0
	11	0	X	1	1
	10	X	0	X	X

$$Y = BD + A\bar{D} + AC$$

2.32

