



hint: $\overline{\overline{(XY + XZ)}} = \overline{(\overline{XY}) \cdot (\overline{XZ})}$

by DeMorgan's Law

2.5-)

X	Y	F
0	0	0
0	1	1
1	0	1
1	1	0

Assume that switches X and Y are initially off (0) and the light is dim (0) in this case.



2.10- a) $\overline{A(B+CD)} = \bar{A} + \overline{(B+CD)} = \bar{A} + (\bar{B} \cdot \bar{C}\bar{D}) = \bar{A} + \bar{B}(\bar{C} + \bar{D})$

b) $\overline{ABC + B(\bar{C} + \bar{D})} = \overline{ABC} \cdot \overline{B(\bar{C} + \bar{D})} = (\bar{A} + \bar{B} + \bar{C}) \cdot (\bar{B} + (\bar{C} + \bar{D}))$
 $= (\bar{A} + \bar{B} + \bar{C}) \cdot (\bar{B} + \bar{C}\bar{D})$

c) $\overline{(\bar{X} + \bar{Y})} = XY$

d) $\overline{(X + Y\bar{Z})} = \bar{X} \cdot (\overline{Y\bar{Z}}) = \bar{X} \cdot (\bar{Y} + Z)$

e) $\overline{(X+Y)Z} = \overline{(X+Y)} + \bar{Z} = \bar{X}\bar{Y} + \bar{Z}$

f) $\overline{(X + \bar{Y}Z)} = \bar{X} \cdot (\overline{\bar{Y}Z}) = \bar{X}Y\bar{Z}$

g) $\overline{X(Y + Z\bar{W} + \bar{V}S)} = \bar{X} + \overline{(Y + Z\bar{W} + \bar{V}S)} = \bar{X} + (\bar{Y} \cdot (\overline{Z\bar{W}}) \cdot (\overline{\bar{V}S}))$
 $= \bar{X} + (\bar{Y} \cdot (\bar{Z} + W) \cdot (V + \bar{S}))$

2.25- c)

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

$f = \bar{A}\bar{D}$

(Two literals)

2.26-) a)

		yz	00	01	11	10
wx	00		1	X	X	1
	01		0	0	0	0
	11		0	0	0	0
	10		1	1	0	0

$$f = \bar{w}\bar{x} + \bar{y}\bar{x}$$

b)

		yz	00	01	11	10
wx	00		X	1	0	0
	01		0	X	1	0
	11		0	1	X	0
	10		0	0	1	X

$$f = \bar{w}\bar{x}\bar{y} + xz + wyz$$

c)

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

$$f = \bar{A}\bar{B} + \bar{C}\bar{D} + AC + ABD$$

2.34-)

(C₀)

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

$$C_0 = \bar{B}\bar{D} + A + D + BD$$

(C₁)

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

$$C_1 = A + \bar{B} + CD + \bar{C}\bar{D}$$

2.34-) (continued)

(C₃)

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

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

(C₄)

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

$$C_4 = \bar{B}\bar{D} + C\bar{D}$$

(C₅)

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

$$C_5 = \bar{C}\bar{D} + B\bar{C} + B\bar{D} + A$$

(C₆)

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

$$C_6 = \bar{B}D + A + C\bar{D} + B\bar{C}$$