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1.

A	B	C	F_1	F_2
0	0	0	1	1
0	0	1	1	0
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	1
1	1	0	1	0
1	1	1	0	0

a. $F_1 = \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + \bar{A}BC + A\bar{B}C + ABC$

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

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

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

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

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

b. $F_2 = (\bar{A}+\bar{B}+\bar{C})(\bar{A}+B+\bar{C})(A+\bar{B}+\bar{C})(A+\bar{B}+C)$

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

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

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

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

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

2. $F(x_1, x_2, x_3) = \sum m(0, 1, 4, 5, 7)$

x_1	x_2	x_3	F
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	1

$F = \bar{x}_1\bar{x}_2\bar{x}_3 + \bar{x}_1\bar{x}_2x_3 + x_1\bar{x}_2\bar{x}_3 + x_1\bar{x}_2x_3 + x_1x_2x_3$

$= \bar{x}_1\bar{x}_2(\bar{x}_3 + x_3) + x_1\bar{x}_2(\bar{x}_3 + x_3) + x_1x_2x_3$

$= \bar{x}_1\bar{x}_2 + x_1\bar{x}_2 + x_1x_2x_3$

$= (\bar{x}_1 + x_1)\bar{x}_2 + x_1x_2x_3$

$= \bar{x}_2 + x_1x_2x_3$

$= \bar{x}_2 + x_1x_3$

3. a. $T = A\bar{C} + A\bar{B}C$

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

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

b. $F = \bar{A} + AB\bar{C} + \overline{\bar{A} + C}$

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

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

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

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