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2.3

a. $AB\bar{C} + B\bar{C}\bar{D} + BC + \bar{C}D = B + \bar{C}D$

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

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

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

$AB + BC + B\bar{C} + \bar{C}D = B + \bar{C}D$

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

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

$B(1+A) + \bar{C}D = B + \bar{C}D$

$B \cdot 1 + \bar{C}D = B + \bar{C}D$

b. $wy + \bar{w}y\bar{z} + wxz + \bar{w}x\bar{y} = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$wy + \bar{w}y\bar{z}(x+\bar{x}) + wxz(y+\bar{y}) + \bar{w}x\bar{y}(z+\bar{z})$

$wy + \bar{w}y\bar{z}x + \bar{w}y\bar{z}\bar{x} + wxzy + wx z\bar{y} + \bar{w}x\bar{y}z + \bar{w}x\bar{y}\bar{z}$

$wy + (\bar{w}y\bar{z}x + \bar{w}\bar{y}\bar{z}x) + (wxz\bar{y} + \bar{w}x\bar{y}z) + \bar{w}y\bar{z}\bar{x} + wxyz$

$wy + (\bar{w}x\bar{z}) + (x\bar{y}z) + \bar{w}y\bar{z}\bar{x} + wxyz$

$wy(xz + \bar{x}\bar{z}) + \bar{w}x\bar{x}\bar{z} + wxyz + (\bar{w}x\bar{z}) + (x\bar{y}z)$

$wxyz + wy(\bar{x}\bar{z}) + \bar{w}y\bar{x}\bar{z} + wxyz + (\bar{w}x\bar{z}) + (x\bar{y}z)$

$(wxyz + wxyz) + wy(\bar{x}+\bar{z}) + \bar{w}y\bar{x}\bar{z} + \bar{w}x\bar{z} + x\bar{y}z$

$wxyz + w\bar{x}y + w\bar{z}y + \bar{w}y\bar{x}\bar{z} + \bar{w}x\bar{z} + x\bar{y}z$

$wxyz + (w\bar{x}yz + w\bar{x}y\bar{z}) + (w\bar{z}yx + w\bar{z}y\bar{x} + \bar{w}y\bar{x}\bar{z} + \bar{w}x\bar{z} + x\bar{y}z$

$(wxyz + w\bar{x}yz) + wy\bar{z} + \bar{x}y\bar{z} + \bar{w}x\bar{z} + x\bar{y}z$

$(wyz + wy\bar{z}) + \bar{x}y\bar{z} + \bar{w}x\bar{z} + x\bar{y}z$

$= wy + \bar{x}y\bar{z} + \bar{w}x\bar{z} + x\bar{y}z = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

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

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

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

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

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

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

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

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

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

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

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

2.4 $(A+C) \cdot (\bar{A}+B) \cdot (B+C) = BC$ $A+B=1$ dan $AB=0$

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

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

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

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

$C(B+\overline{A+B}) = BC$

$C(B+\bar{1}) = BC$

$C(B+0) = BC$

$BC = BC$