(a)

(i)

w	x	y	z	a	b	c	d	e	f	g
0	0	0	0	1	1	1	1	1	1	0
0	0	0	1	0	1	1	0	0	0	0
0	0	1	0	1	1	0	1	1	0	1
0	0	1	1	1	1	1	1	0	0	1
0	1	0	0	0	1	1	0	0	1	1
0	1	0	1	1	0	1	1	0	1	1
0	1	1	0	1	0	1	1	1	1	1
0	1	1	1	1	1	1	0	0	0	0
1	0	0	0	1	1	1	1	1	1	1
1	0	0	1	1	1	1	1	0	1	1
mmmm										

(ii)

$$a = \bar{w}\bar{x}\bar{y}\bar{z} + \bar{w}\bar{x}y\bar{z} + \bar{w}\bar{x}yz$$

$$+ \bar{w}x\bar{y}z + \bar{w}xy\bar{z} + \bar{w}xyz + w\bar{x}\bar{y}\bar{z}$$

$$+ \omega \bar{x} \bar{y} z$$

$$= \bar{\omega} \bar{x} \bar{z} + \bar{\omega} x z + \omega \bar{x} \bar{y} + \bar{\omega} y$$

$$b = \bar{\omega} \bar{x} \bar{y} \bar{z} + \bar{\omega} \bar{x} \bar{y} z + \bar{\omega} \bar{x} y \bar{z} + \bar{\omega} \bar{x} y z$$

$$+ \bar{\omega} x \bar{y} \bar{z} + \bar{\omega} x y z + \omega \bar{x} \bar{y} \bar{z} + \omega \bar{x} \bar{y} z$$

$$= \bar{\omega} \bar{x} y \bar{z} + \bar{\omega} x \bar{y} \bar{z} + \bar{x} \bar{y} + \bar{\omega} y z$$

$$= \bar{\omega} \bar{y} \bar{z} + \bar{\omega} \bar{x} \bar{z} + \bar{x} \bar{y} + \bar{\omega} y z$$

$= \bar{\omega} \bar{x}$ car on a

$\bar{\omega} \bar{x} z y$

ou $\bar{\omega} \bar{x} z \bar{y}$

w	x	y	z	a	b	c	d	e	f	g
0	0	0	0	1	1	1	1	1	1	0
0	0	0	1	0	1	1	0	0	0	0
0	0	1	0	1	1	0	1	1	0	1
0	0	1	1	1	1	1	1	0	0	1
0	1	0	0	0	1	1	0	0	1	1
0	1	0	1	1	0	1	1	0	1	1
0	1	1	0	1	0	1	1	1	1	1
0	1	1	1	1	1	1	0	0	0	0
1	0	0	0	1	1	1	1	1	1	1
1	0	0	1	1	1	1	1	0	1	1
1	0	1	0	1	1	0	1	1	1	1
1	0	1	1	1	1	1	1	0	1	1
1	1	0	1	1	0	1	1	0	1	1
1	1	1	0	1	0	1	1	1	1	1
1	1	1	1	1	1	1	1	0	1	1

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$$a = (w + x + y + \bar{z})(w + \bar{x} + y + z)$$

$$= w + y + xw + xz + \bar{z}\bar{x}$$

$xz + \bar{z}\bar{x}$: XNOR

$$b =$$

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

$$= \bar{x} + \cancel{wyz} + w\bar{z}\bar{y} + \bar{z}\bar{y}\bar{w}$$

$$+ yz + \cancel{wyz}$$

$$= \bar{x} + \overline{(y \oplus z)}$$

c: $(w + x + \bar{y} + z)(\bar{w} + x + \bar{y} + z)$

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

d: $(w + x + y + \bar{z})(w + x + y + z)(w + \bar{x} + \bar{y} + \bar{z})$

$= w + xy\bar{z} + yx + y\bar{z} + \bar{z}x + x\bar{y}z$

e: $\bar{w}y\bar{z} + x\bar{y}\bar{z} + w\bar{x}y\bar{z} + wxy\bar{z}$

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

$= y\bar{z} + x\bar{y}\bar{z} = \bar{z}(x\bar{y} + y)$

$= \bar{z}(x + y)$

$h: xy + xz + w$

(b)

$a = \overline{x}\,\overline{y} + x2 + y + w$

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$x = 1$
$y = 1$
$S = 1$

$x - y$
$= 1 + 0 + 1$
$= 10$

$-1x = -1$
$+0y = 0$
$-1S = -1$

$x - y$
$= 1 + 1 + 1$
$= 11$

-1

op	$g(x,y)$
0	$x + \bar{y} + 1$
1	$x + y$