Exercícios de Lógica: Lista 1b (respostas)

Mostre a tabela verdade para cada uma das funções abaixo:

a) $Y = (\overline{a} + b) \cdot (a + \overline{b})$

b) $y = (\overline{a.b}) + (\overline{c.d})$

c) $y = (\overline{a.b + c.d})$

d) $y = a.\ (b + \overline{c}) + (\overline{a}.b)$

e) $y = (a+b.c).((\overline{a}+b.d)+\overline{c})$

f) $y = (\overline{a.(b+c)}) + (\overline{a+b.c})$

Respostas:

a) $Y = (\overline{a} + b) \cdot (a + \overline{b})$

a	**b**	**y**	$\overline{a}$	$\overline{a}+b$	$\overline{b}$	$a+\overline{b}$	$(\overline{a}+b).(a+\overline{b})$
0	0	**1**	1	1		1	**1**
0	1	**0**	1	1		0	**0**
1	0	**0**	0	0		1	**0**
1	1	**1**	0	1		1	**1**

b) $y = (\overline{a.b}) + (\overline{c.d})$

a	**b**	**c**	**d**	**y**	**a.b**	$\overline{a.b}$	**c.d**	$\overline{c.d}$	$(\overline{a.b}) + (\overline{c.d})$
0	0	0	0	**1**	0	1	0	1	**1**
0	0	0	1	**1**	0	1	0	1	**1**
0	0	1	0	**1**	0	1	0	1	**1**
0	0	1	1	**1**	0	1	1	0	**1**
0	1	0	0	**1**	0	1	0	1	**1**
0	1	0	1	**1**	0	1	0	1	**1**
0	1	1	0	**1**	0	1	0	1	**1**
0	1	1	1	**1**	0	1	1	0	**1**
1	0	0	0	**1**	0	1	0	1	**1**
1	0	0	1	**1**	0	1	0	1	**1**
1	0	1	0	**1**	0	1	0	1	**1**
1	0	1	1	**1**	0	1	1	0	**1**
1	1	0	0	**1**	1	0	0	1	**1**
1	1	0	1	**1**	1	0	0	1	**1**
1	1	1	0	**1**	1	0	0	1	**1**
1	1	1	1	**0**	1	0	1	0	**0**

c) $y = \overline{(a.b + c.d)}$

a	**b**	**c**	**d**	**y**	**a.b**	**c.d**	**a.b + c.d**	$\overline{\textbf{a.b + c.d}}$
0	0	0	0	**1**	0	0	**0**	**1**
0	0	0	1	**1**	0	0	**0**	**1**
0	0	1	0	**1**	0	0	**0**	**1**
0	0	1	1	**0**	0	1	**1**	**0**
0	1	0	0	**1**	0	0	**0**	**1**
0	1	0	1	**1**	0	0	**0**	**1**
0	1	1	0	**1**	0	0	**0**	**1**
0	1	1	1	**0**	0	1	**1**	**0**
1	0	0	0	**1**	0	0	**0**	**1**
1	0	0	1	**1**	0	0	**0**	**1**
1	0	1	0	**1**	0	0	**0**	**1**
1	0	1	1	**0**	0	1	**1**	**0**
1	1	0	0	**0**	1	0	**1**	**0**
1	1	0	1	**0**	1	0	**1**	**0**
1	1	1	0	**0**	1	0	**1**	**0**
1	1	1	1	**0**	1	1	**1**	**0**

d) $y = a.\ (b + \overline{c}) + (\overline{a}.b)$

a	**b**	**c**	**y**	$\overline{\textbf{a}}$	$\overline{\textbf{c}}$	**b+$\overline{\textbf{c}}$**	**a.(b+$\overline{\textbf{c}}$)**	$\overline{\textbf{a}}$**.b**	**(a.(b+$\overline{\textbf{c}}$)) + ($\overline{\textbf{a}}$.b)**
0	0	0	**0**	1	1	1	0	0	**0**
0	0	1	**0**	1	0	0	0	0	**0**
0	1	0	**1**	1	1	1	0	1	**1**
0	1	1	**1**	1	0	1	0	1	**1**
1	0	0	**1**	0	1	1	1	0	**1**
1	0	1	**0**	0	0	0	0	0	**0**
1	1	0	**1**	0	1	1	1	0	**1**
1	1	1	**1**	0	0	1	1	0	**1**

e) $y = (a+b.c).((\overline{a}+b.d)+\overline{c})$

a	**b**	**c**	**d**	**b.c**	**a+b.c**	**b.d**	$\overline{a}$	$\overline{a}+b.d$	$\overline{c}$	$(\overline{a}+b.d)+\overline{c}$	$(a+b.c).((\overline{a}+b.d)+\overline{c})$
0	0	0	0	0	0	0	1	1	1	1	**0**
0	0	0	1	0	0	0	1	1	0	1	**0**
0	0	1	0	0	0	0	1	1	1	1	**0**
0	0	1	1	0	0	0	1	1	0	1	**0**
0	1	0	0	0	0	0	1	1	1	1	**0**
0	1	0	1	0	0	1	1	1	0	1	**0**
0	1	1	0	1	1	0	1	1	1	1	**1**
0	1	1	1	1	1	1	1	1	0	1	**1**
1	0	0	0	0	1	0	0	0	1	1	**1**
1	0	0	1	0	1	0	0	0	0	1	**1**
1	0	1	0	0	1	0	0	0	1	0	**0**
1	0	1	1	0	1	0	0	0	0	0	**0**
1	1	0	0	0	1	0	0	0	1	1	**1**
1	1	0	1	0	1	1	0	1	0	1	**1**
1	1	1	0	1	1	0	0	0	1	0	**0**
1	1	1	1	1	1	1	0	1	0	1	**1**

f) $y = (\overline{a.(b+c)}) + (\overline{a+b.c})$

a	**b**	**c**		**b+c**	**a.(b+c)**	$\overline{a.(b+c)}$	**b.c**	**a+b.c**	$\overline{a+b.c}$	$\overline{a.(b+c)} + \overline{a+b.c}$
0	0	0		0	0	1	0	0	1	**1**
0	0	1		1	0	1	0	0	1	**1**
0	1	0		1	0	1	0	0	1	**1**
0	1	1		1	0	1	1	1	0	**1**
1	0	0		0	0	1	0	1	0	**1**
1	0	1		1	1	0	0	1	0	**0**
1	1	0		1	1	0	0	1	0	**0**
1	1	1		1	1	0	1	1	0	**0**