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Matemáticas Discretas

1 a)

p	q	r	s	$p \rightarrow q$	$r \rightarrow s$	$p \rightarrow q) \wedge (r \rightarrow s$
1	1	1	1	1	1	1
1	1	1	0	1	0	0
1	1	0	1	1	1	1
1	1	0	0	1	1	1
1	0	1	1	0	1	0
1	0	1	0	0	0	0
1	0	0	1	0	1	0
1	0	0	0	0	1	0
0	1	1	1	1	1	1
0	1	1	0	1	0	0
0	1	0	1	1	1	1
0	1	0	0	1	1	1
0	0	1	1	1	1	1
0	0	1	0	1	0	0
0	0	0	1	1	1	1
0	0	0	0	1	1	1

1 b)

p	q	r	s	$p \vee r$	$q \vee s$	$(p \vee r) \rightarrow (q \vee s)$
1	1	1	1	1	1	1
1	1	1	0	1	0	0
1	1	0	1	1	1	1
1	1	0	0	1	0	0
1	0	1	1	1	0	0
1	0	1	0	1	0	0
1	0	0	1	1	0	0
1	0	0	0	1	0	0
0	1	1	1	1	1	1
0	1	1	0	1	0	0
0	1	0	1	0	1	1
0	1	0	0	0	0	1
0	0	1	1	1	0	0
0	0	1	0	1	0	0
0	0	0	1	0	0	1
0	0	0	0	0	0	1

2 a)

p	q	r	~p	p → q
1	1	1	0	1
1	1	0	0	1
1	0	1	0	0
1	0	0	0	0
0	1	1	1	1
0	1	0	1	1
0	0	1	1	1
0	0	0	1	1

2 b)

p	q	r	~q	p → q	p∧~q	~(p∧~q)	~(p∧~q) → r
1	1	1	0	1	0	1	1
1	1	0	0	1	0	1	1
1	0	1	1	0	1	0	0
1	0	0	1	0	1	0	0
0	1	1	0	1	0	1	1
0	1	0	0	1	0	1	1
0	0	1	1	1	0	1	1
0	0	0	1	1	0	1	1

3 a)

p	q	r	~p	p∧q
1	1	1	0	1
1	1	0	0	1
1	0	1	0	0
1	0	0	0	0
0	1	1	1	0
0	1	0	1	0
0	0	1	1	0
0	0	0	1	0

3 b)

p	q	r	~q	p → q	p∧~q	~(p∧~q)	~(p∧~q) → r
1	1	1	0	1	0	1	1
1	1	0	0	1	0	1	1
1	0	1	1	0	1	0	0
1	0	0	1	0	1	0	0
0	1	1	0	1	0	1	1
0	1	0	0	1	0	1	1
0	0	1	1	1	0	1	1
0	0	0	1	1	0	1	1

4 a)

p	q	r	p → q	p → q	(p → q)V(p →
1	1	1	1	1	1
1	1	0	1	0	1
1	0	1	0	1	1
1	0	0	0	0	0
0	1	1	1	1	1
0	1	0	1	1	1
0	0	1	1	1	1
0	0	0	1	1	1

4 b)

p	q	r	(qVr)	p → (qVr)
1	1	1	1	1
1	1	0	1	1
1	0	1	1	1
1	0	0	0	0
0	1	1	1	1
0	1	0	1	1
0	0	1	1	1
0	0	0	0	1

5 a)

p	q	r	s	p → q	r → s	p → q)Λ(r → s)
1	1	1	1	1	1	1
1	1	1	0	1	0	0
1	1	0	1	1	1	1
1	1	0	0	1	1	1
1	0	1	1	0	1	0
1	0	1	0	0	0	0
1	0	0	1	0	1	0
1	0	0	0	0	1	0
0	1	1	1	1	1	1
0	1	1	0	1	0	0
0	1	0	1	1	1	1
0	1	0	0	1	1	1
0	0	1	1	1	1	1
0	0	1	0	1	0	0
0	0	0	1	1	1	1
0	0	0	0	1	1	1

5 b)

p	q	r	s	~q	~s	~p	~r	(~qV~s)	(~pV~r)	(~qV~s) → (~pV~
1	1	1	1	0	0	0	0	0	0	1
1	1	1	0	0	1	0	0	1	0	0
1	1	0	1	0	0	0	1	0	1	1
1	1	0	0	0	1	0	1	1	1	1
1	0	1	1	1	0	0	0	1	0	0
1	0	1	0	1	1	0	0	1	0	0
1	0	0	1	1	0	0	1	1	1	1
1	0	0	0	1	1	0	1	1	1	1
0	1	1	1	0	0	1	0	0	1	1
0	1	1	0	0	1	1	0	1	1	1
0	1	0	1	0	0	1	1	0	1	1
0	1	0	0	0	1	1	1	1	1	1
0	0	1	1	1	0	1	0	1	1	1
0	0	1	0	1	1	1	0	1	1	1
0	0	0	1	1	0	1	1	1	1	1
0	0	0	0	1	1	1	1	1	1	1