Question #75152, Math / Algebra

Construct the truth table for the compound statement (p logical and tilde q logical) and tilde r

$$(p \cup (\sim q)) \cup (\sim r)$$

Solution

1. First, the operations of logical not:

a	$\sim a$
0	1
1	0

2. Then go to the logical and:

a	b	$a \cup b$
0	0	0
0	1	0
1	0	0
1	1	1

3. In brackets (p logical and tilde q logical), then the remaining action, the entire expression.

p	q	r	$\sim q$	$\sim r$	$p \cup (\sim q)$	$(p \cup (\sim q)) \cup (\sim r)$
0	0	0	1	1	0	0
0	0	1	1	0	0	0
0	1	0	0	1	0	0
0	1	1	0	0	0	0
1	0	0	1	1	1	1
1	0	1	1	0	1	0
1	1	0	0	1	0	0
1	1	1	0	0	0	0

Answer:

p	q	r	$(p \cup (\sim q)) \cup (\sim r)$
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

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