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1. Boolean Algebra

NOT (15 + 3 > 23 - 7) OR (14 / 7 ≥ 1 ^ 2 AND 7 * 4 < 3 * 10)
NOT (18 > 16) OR (2 ≥ 1 AND 28 < 30)
NOT TRUE OR (TRUE AND TRUE) = FALSE OR TRUE
TRUE

1. TRUE

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2. Boolean Algebra

NOT (A OR NOT B) OR (NOT B AND A)
= (NOT A AND NOT (NOT B)) OR (NOT B AND A)
= (NOT A AND B) OR (NOT B AND A)
This is TRUE if A and B are different which is (0,1) and (1,0).

2. (0,1) and (1,0)

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3. Boolean Algebra

1	2	3	4	5	6	7	8
A	B	~A	~B	~A*~B	~(~A*~B)	A*B	6+7
0	0	1	1	1	0	0	0
0	1	1	0	0	1	0	1
1	0	0	1	0	1	0	1
1	1	0	0	0	1	1	1

3. 1

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4. Boolean Algebra

~(A * ~B) + ~(~A * B) = ~A + ~(~B) + ~(~A) + ~B
= ~A + B + A + ~B = 1
By regrouping, (~A + A) and (~B + B) are both 1 and 1 + 1 = 1 in
Boolean Algebra (not 2 as in regular arithmetic). This is always
TRUE so it is a tautology.

4. 1

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5. Boolean Algebra

A. ~(~B) + ~(~A) = B OR A which is TRUE for (1,1), (1,0), (0,1).
B. A + ~B is TRUE if A = 1 or B = 0 which is (1,1), (1,0), and (0,0).
C. A * ~B is only TRUE if A = 1 and B = 0 which is (1,0).
D. ~(A * B) = ~A + ~B is TRUE A = 0 or B = 0 which is (0,1),
     (0,0), (1,0).
Therefore, A, B, and D are all TRUE 3 times and FALSE once.

5. A, B, D