MTH 301
Quiz 1
Fall 2017

20 points possible.

1. (3 pts.) Use De Morgan's laws to write the negation for the following statement.

Bottle Creek is on North Caicos and Whitby is on Middle Caicos.

2. (2 pts.) Construct the truth table for the following statement form.

$$p \wedge \sim q$$

3. (3 pts.) Write the contrapositive for the following statement.

If Anna is miserable, then Bates is at the pub.

4. (3 pts.) Construct the truth table for the following statement form.

$$(\sim p \wedge q) \rightarrow p$$

5. (4 pts.) Use a truth table to determine whether the argument form is valid or invalid. Indicate which columns represent the premises and which represents the conclusion of the argument. Clearly label the "critical rows." Don't forget to say "valid" or "invalid"!

$p \to q$
$\sim q \vee r$
$\therefore\ p$

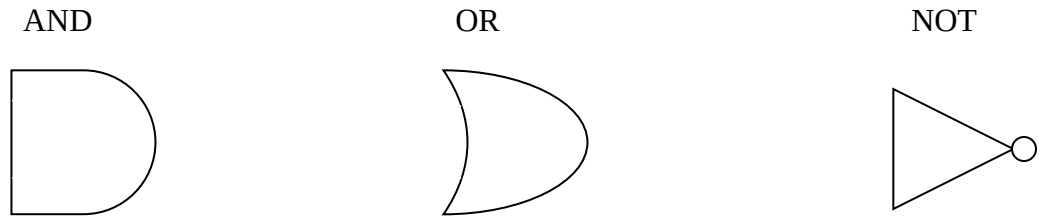
6. (2 pts.) A supplemental page shows a circuit (labeled "Problem 6").

Give the output signal if the input signals are as indicated.

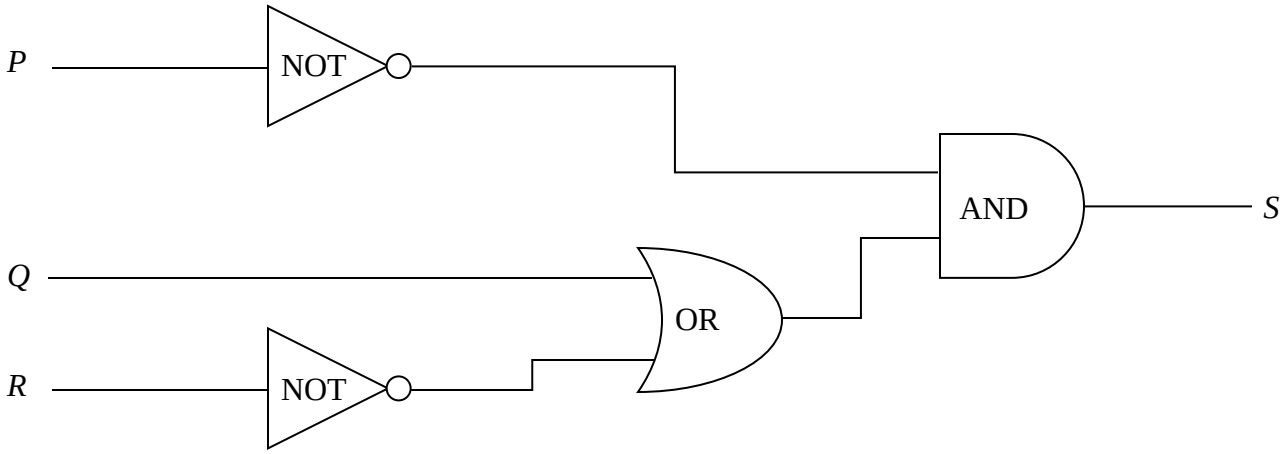
input signals: $P = 0, \quad Q = 0, \quad R = 0$

7. (3 pts.) For the given truth table, construct a Boolean expression having the given table as its truth table. (The inputs are P, Q, and R; the output is S.)

P	Q	R	S
1	1	1	0
1	1	0	1
1	0	1	1
1	0	0	0
0	1	1	1
0	1	0	0
0	0	1	0
0	0	0	0



Problem 6.



input signals: $P = 0$, $Q = 0$, $R = 0$