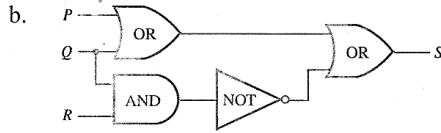
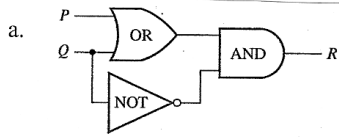


**Math 245: Digital Logic Circuits**

1. Give the output signal for the circuit below, if the input signals are  $P = 1$ ,  $Q = 0$  and  $R = 0$ .



2. Construct a circuit for the Boolean expression:  $\sim (P \wedge Q) \vee P$

3. Construct a Boolean expression having the given table as its truth table (with T = 1 and F = 0) and then draw the corresponding circuit.

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

4. Use the properties listed in Theorem 1.1.1 to show that the following circuits have the same input/output table. That is, find the Boolean expressions for the circuits and show that they are logically equivalent.

