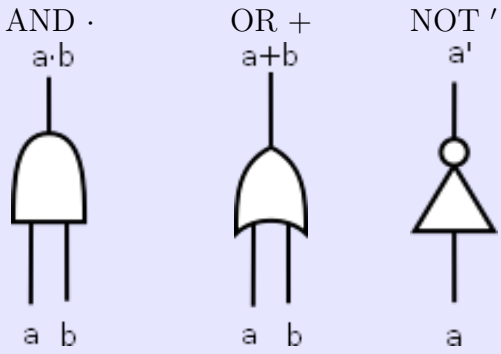
3.5 Logic Circuits

3.5.1 Logic Circuits

We are going to be using logic gates as one way to represent our Boolean Algebra expressions graphically. The gates that we will be using are:



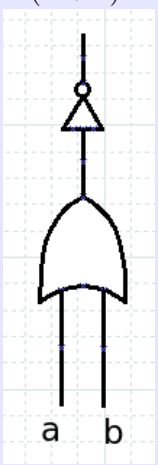
a	b	$a \cdot b$
0	0	0
0	1	0
1	0	0
1	1	1

a	b	$a + b$
0	0	0
0	1	1
1	0	1
1	1	1

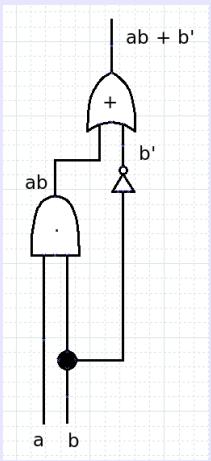
a	a'
0	1
1	0

Additionally, we can connect gates together in order to build an expression. For example:

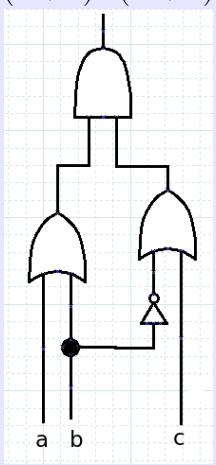
$(a + b)'$



$ab + a'b$

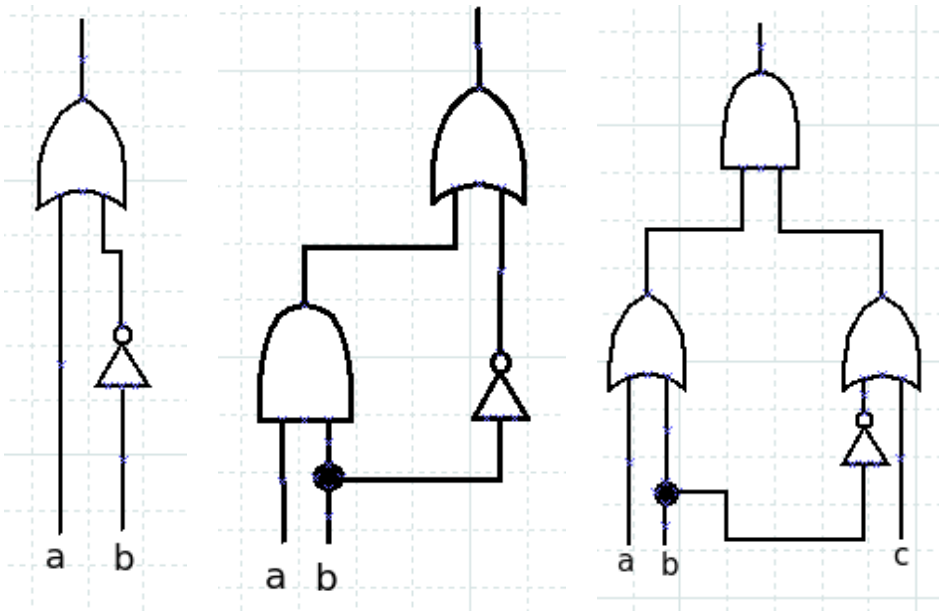


$(a + b) \cdot (b' + c)$



Question 1

Write out the Boolean expression that describes each diagram:



Question 2

Draw a circuit diagram for the following Boolean expressions:

a. $a + b'$ b. $a' \cdot b'$ c. $a + (b \cdot c)$

3.5.2 2-variable Karnaugh Maps

3.5.3 3-variable Karnaugh Maps