

# Logic Gates Homework

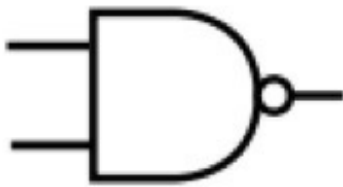
You should refer to the **homework policy** for details on how this homework should be submitted.

**Attempt all questions and show all working.**

**This homework may not appear correctly in Dillinger due to the boolean expressions used. However, it will work correctly in both StackEdit and Haroopad (with the Maths preferences turned on)**

## Question 1

Fill in the following truth tables for the given logic gates.



**NAND** gate:  $\overline{A \cdot B}$

Input A	Input B	Output Q
0	0	1
0	1	1
1	0	1
1	1	0

□



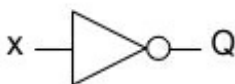
**OR** gate:  $A + B$

Input A	Input B	Output Q
0	0	0
0	1	1
1	0	1
1	1	1

(4 marks)

## Question 2

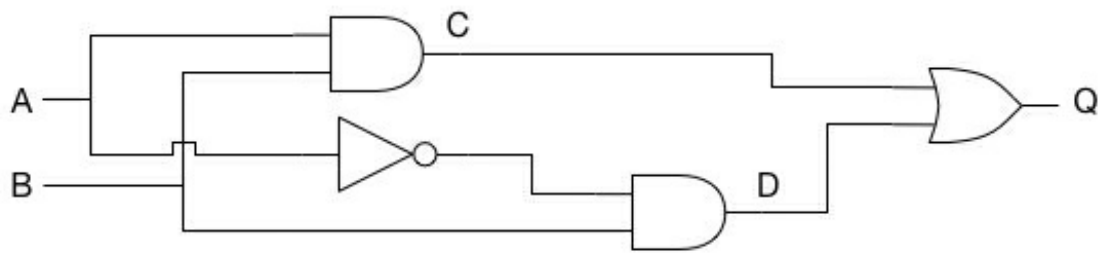
What are the boolean notations for the following gates:

Logic Gate	Boolean Expression
	<i>AND gate symbol</i>
	<i>OR gate symbol</i>
	<i>NOT gate symbol</i>

(3 marks)

## Question 3

Complete the truth table for this circuit



Input A	Input B	Output C	Output D	Output Q
0	0	0	0	0
0	1	0	1	1
1	0	0	0	0
1	1	1	0	1

(4 marks)

## Question 4

The alarm in your kitchen will sound if it senses heat or smoke.

Complete the truth table for this circuit.

Senses heat	Senses smoke	Alarm Active
0	0	0
0	1	1
1	0	1
1	1	1

State which logic gate would be used to determine whether the alarm will go off: *\*OR gate symbol.*

**(2 marks)**

**Total 13 marks**