**You need to be able to draw out logic gates from a given expression and complete truth tables.**

**Example**:

Logic gates can be combined to form more complex logic circuits.

For example, the logic circuit for the Boolean expression (NOT (A AND B)) OR C is as follows:

**B**

**A**

**E**

**D**

**Q**

**C**

You work with the **brackets first**, just like BODMAS approach in mathematics, creating each circuits along the way.

**--------------------------------------------C(A+B)-----------------------------------------------**

**Activity 1** –

Consider the Boolean expression **(NOT (A OR B)) AND (NOT (A AND C)).**

a) **Draw** the logic circuit for this expression. Label the inputs and outputs of all logic gates [6]

b) Complete a **truth table for** this expression. Include columns for all of your input and   
output labels. [5]

**Gate symbols:**

C

Q

A

B

|  |  |  |  |
| --- | --- | --- | --- |
| A | B | C | Q |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 0 |

**Activity 2 –** Create an expression of the circuit below.

**B**

**A**

**E**

**Q**

**C**

**G**

(NOT (A OR B) AND NOT(A OR C))