Boolean Logic Worksheet

1. Complete the following truth table.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A** | **B** | **AND** | **OR** | **XOR** | **NOT A** | **NAND** | **NOR** |
| 0 | 0 |  |  |  |  |  |  |
| 0 | 1 |  |  |  |  |  |  |
| 1 | 0 |  |  |  |  |  |  |
| 1 | 1 |  |  |  |  |  |  |

1. Complete the following truth table for the Boolean expression

**A** AND (**B** OR **A**)

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | **B** | **(B OR A)** | **A AND** (B OR A) |
| 0 | 0 |  |  |
| 0 | 1 |  |  |
| 1 | 0 |  |  |
| 1 | 1 |  |  |

1. Complete the following truth table for the Boolean expression

NOT **A** AND **B** XOR **A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **A** | **B** | **NOT A** | NOT A **AND B** | NOT A AND B **XOR A** |
| 0 | 0 |  |  |  |
| 0 | 1 |  |  |  |
| 1 | 0 |  |  |  |
| 1 | 1 |  |  |  |

1. Create a truth table for the Boolean expression

**A** NAND (**B** NOR **A**)

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | **B** | (**B NOR A**) | **A NAND** (B NOR A) |
| 0 | 0 |  |  |
| 0 | 1 |  |  |
| 1 | 0 |  |  |
| 1 | 1 |  |  |

1. Complete the following truth table for the Boolean expression

(**A** XOR **B**) OR (**A** NAND **C**)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **A** | **B** | **C** | **(A XOR B)** | **(A NAND C)** | **OR** |
| 0 | 0 | 0 |  |  |  |
| 0 | 1 | 0 |  |  |  |
| 1 | 0 | 0 |  |  |  |
| 1 | 1 | 0 |  |  |  |
| 0 | 0 | 1 |  |  |  |
| 0 | 1 | 1 |  |  |  |
| 1 | 0 | 1 |  |  |  |
| 1 | 1 | 1 |  |  |  |

Graphical user interface, text, application, chat or text message

Description automatically generated

1. Create a logic diagram for the following Boolean expression.

(**A** AND **B**) OR **B**

Graphical user interface, text, application, chat or text message

Description automatically generated

1. Create a logic diagram for the following Boolean expression.

(A OR NOT B) OR (A NAND B)

Graphical user interface, text, application, chat or text message

Description automatically generated

1. Create a logic diagram for the following Boolean expression.

A OR (A XOR B)

Graphical user interface, text, application, chat or text message

Description automatically generated

1. Create a logic diagram for the following Boolean expression.

A XOR B OR B AND C