**Assignment #4.01 – Logical Expressions, Part I**

Due: TBA - see gwss.edu20.org

For each of the following Logic Expressions:

1. draw the schematic diagram.
2. complete the truth table.
3. (A ● B) ● C = X

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Diagram |  | **A** | **B** | **C** | **X** |
|  | 0 | 0 | 0 | 0 |
|  | 0 | 0 | 1 | 0 |
|  | 0 | 1 | 0 | 0 |
|  | 0 | 1 | 1 | 0 |
|  | 1 | 0 | 0 | 0 |
|  | 1 | 0 | 1 | 0 |
|  | 1 | 1 | 0 | 0 |
|  | 1 | 1 | 1 | 1 |

1. A ● (B ● C) = X

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Diagram |  | **A** | **B** | **C** | **X** |
|  | 0 | 0 | 0 | 0 |
|  | 0 | 0 | 1 | 0 |
|  | 0 | 1 | 0 | 0 |
|  | 0 | 1 | 1 | 0 |
|  | 1 | 0 | 0 | 0 |
|  | 1 | 0 | 1 | 0 |
|  | 1 | 1 | 0 | 0 |
|  | 1 | 1 | 1 | 1 |

1

1. (A + B) + C = X

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Diagram |  | **A** | **B** | **C** | **X** |
|  | 0 | 0 | 0 | 0 |
|  | 0 | 0 | 1 | 1 |
|  | 0 | 1 | 0 | 1 |
|  | 0 | 1 | 1 | 1 |
|  | 1 | 0 | 0 | 1 |
|  | 1 | 0 | 1 | 1 |
|  | 1 | 1 | 0 | 1 |
|  | 1 | 1 | 1 | 1 |

1. A + (B + C) = X

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Diagram |  | **A** | **B** | **C** | **X** |
|  | 0 | 0 | 0 | 0 |
|  | 0 | 0 | 1 | 1 |
|  | 0 | 1 | 0 | 1 |
|  | 0 | 1 | 1 | 1 |
|  | 1 | 0 | 0 | 1 |
|  | 1 | 0 | 1 | 1 |
|  | 1 | 1 | 0 | 1 |
|  | 1 | 1 | 1 | 1 |

1. (A ● B) + C = X

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Diagram |  | **A** | **B** | **C** | **X** |
|  | 0 | 0 | 0 | 0 |
|  | 0 | 0 | 1 | 1 |
|  | 0 | 1 | 0 | 0 |
|  | 0 | 1 | 1 | 1 |
|  | 1 | 0 | 0 | 0 |
|  | 1 | 0 | 1 | 1 |
|  | 1 | 1 | 0 | 1 |
|  | 1 | 1 | 1 | 1 |

1. A ● (B + C) = X

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Diagram |  | **A** | **B** | **C** | **X** |
|  | 0 | 0 | 0 | 0 |
|  | 0 | 0 | 1 | 0 |
|  | 0 | 1 | 0 | 0 |
|  | 0 | 1 | 1 | 0 |
|  | 1 | 0 | 0 | 0 |
|  | 1 | 0 | 1 | 1 |
|  | 1 | 1 | 0 | 1 |
|  | 1 | 1 | 1 | 1 |

1. A ● B = X

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Diagram |  | **A** | **B** | **X** |
|  | 0 | 0 | 1 |
|  | 0 | 1 | 1 |
|  | 1 | 0 | 1 |
|  | 1 | 1 | 0 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. A ● B = X

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Diagram |  | **A** | **B** | **X** |
|  | 0 | 0 | 1 |
|  | 0 | 1 | 0 |
|  | 1 | 0 | 0 |
|  | 1 | 1 | 0 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. A ● B = X

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Diagram |  | **A** | **B** | **X** |
|  | 0 | 0 | 0 |
|  | 0 | 1 | 1 |
|  | 1 | 0 | 1 |
|  | 1 | 1 | 1 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. A + B = X

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Diagram |  | **A** | **B** | **X** |
|  | 0 | 0 | 1 |
|  | 0 | 1 | 0 |
|  | 1 | 0 | 0 |
|  | 1 | 1 | 0 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. A + B = X

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Diagram |  | **A** | **B** | **X** |
|  | 0 | 0 | 1 |
|  | 0 | 1 | 1 |
|  | 1 | 0 | 1 |
|  | 1 | 1 | 0 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. A + B = X

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Diagram |  | **A** | **B** | **X** |
|  | 0 | 0 | 0 |
|  | 0 | 1 | 0 |
|  | 1 | 0 | 0 |
|  | 1 | 1 | 1 |
|  |  |  |  |
|  |  |  |  |