# Group 1

**Problem 3.11.**

*Show truth tables that verify the equivalence of the following two propositional formulas*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| P | Q | P XOR Q | NOT (P IFF Q) | |
| T | T | **F** | **F** | T |
| T | F | **T** | **T** | F |
| F | T | **T** | **T** | F |
| F | F | **F** | **F** | T |

**Problem 3.12.**

*Prove that the propositional formulas*

*And*

*are equivalent*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| P | Q | R |  |  |  |  |  |  |  |  |
| T | T | T | F | F | F | **T** | F | T | T | **T** |
| T | T | F | T | T | T | **T** | F | F | F | **T** |
| T | F | T | T | T | F | **T** | F | F | F | **T** |
| T | F | F | F | T | F | **T** | F | F | F | **T** |
| F | T | T | F | F | F | **T** | T | T | F | **T** |
| F | T | F | F | T | T | **T** | F | F | F | **T** |
| F | F | T | F | F | F | **T** | T | T | F | **T** |
| F | F | F | F | F | F | **F** | F | F | F | **F** |

**Problem 3.13.**

*Prove by truth table that OR distributes over AND, namely,*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| P | Q | R |  | | |  | | |
| T | T | T |  | **T** | T | T | **T** | T |
| T | T | F |  | **T** | F | T | **T** | T |
| T | F | T |  | **T** | F | T | **T** | T |
| T | F | F |  | **T** | F | T | **T** | T |
| F | T | T |  | **T** | T | T | **T** | T |
| F | T | F |  | **F** | F | T | **F** | F |
| F | F | T |  | **F** | F | F | **F** | T |
| F | F | F |  | **F** | F | F | **F** | F |