**Logical Operator Practice**

**Directions:** Complete the Truth Tables

1)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| P | Q | !Q | !P | P&&Q | P||Q |
| T | T | F | F | T | T |
| T | F | T | F | F | T |
| F | T | F | T | F | T |
| F | F | T | T | F | F |

2)

|  |  |  |  |
| --- | --- | --- | --- |
| P | Q | !(P||Q) | !(P && Q) |
| T | T | F | F |
| T | F | F | T |
| F | T | F | T |
| F | F | T | T |

3)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| P | Q | R | !P && Q | !R | !P && Q || !R |
| T | T | T | F | F | F |
| T | T | F | F | T | T |
| T | F | T | F | F | F |
| T | F | F | F | T | T |
| F | T | T | T | F | T |
| F | T | F | T | T | T |
| F | F | T | F | F | F |
| F | F | F | F | T | T |

4) Create your own truth table to determine when the phrase P&&Q || (Q&& !R) will be evaluated to true. Specifically, what combinations of P, Q, and R will evaluate the expression to true?

* All True
* P = True, Q = True, R = False
* P = False, Q = True, R = False

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| P | Q | R | P && Q | Q && !R | P&&Q || Q && !R |
| T | T | T | T | F | T |
| T | T | F | T | T | T |
| T | F | T | F | F | F |
| T | F | F | F | F | F |
| F | T | T | F | F | F |
| F | T | F | F | T | T |
| F | F | T | F | F | F |
| F | F | F | F | F | F |