1) Fill out table

| P | Q | ~P  (NOT) | P^Q  (AND) | PvQ  (OR) | P↓Q  (NOR) | P⊻Q |
| --- | --- | --- | --- | --- | --- | --- |
| T | T | F | T | T | F | F |
| T | F | F | F | T | F | T |
| F | T | T | F | T | F | T |
| F | F | T | F | F | T | F |

2) XOR is a state that requires one true state and one false state to equal TRUE.

3) AND is a state that requires two true states to equal true.

4) OR is a binary state that requires only one true state to equal true. So one true and one false state are true, one false and one true state are true, two true states are true, but two false states are false

5) Negation is the opposite of a state. If a state is true, the opposite state is therefore false (not true). If a state is false, the opposite is true (not false).

6) NOR is a binary state that is the opposite of an OR state. So two true states equals a false state, one true and one false state equal a true state, one false and one true state equal true, and two false states equal true

7) Unary operators have only two possible outcomes, either true or false (not true and not false)

8) Binary operators require for there to be a combination of two states to produce an outcome.

9) T T = T

F F = F

F T = F

T F = F

This indicates an AND operator, as it requires two true states to equal the outcome being true

10) T T = T

F F = F

F T = T

T F = T

| A | B | A OR B |  |  |
| --- | --- | --- | --- | --- |
| T | T | T |  |  |
| T | F | T |  |  |
| F | T | T |  |  |
| F | F | F |  |  |

This indicates an OR operator, as it requires only one true state for the outcome to equal true.

11) A B

T | T = F

F | F = F

F |T = T

T | F = T

This indicates an exclusive OR state, or XOR, as it requires one true and one false state to have a true outcome