

2.3 The Disjunction and Conjunction of Statements

(Def) The **disjunction** of the statements P and Q is the statement " P **or** Q " and is denoted by $P \vee Q$.

$P \vee Q$ is true if _____ of P and Q _____ true; otherwise, $P \vee Q$ is false.

i.e., $P \vee Q$ is true if exactly one of P and Q is true or both P and Q are true.

e.g., P_1 : the integer 2 is even. P_2 : the integer 34 is prime.

$P_1 \vee P_2$:

which is _____ since

P	Q	$P \vee Q$	$P \wedge Q$

(Def) The **conjunction** of the statements P and Q is the statement " P **and** Q " and is denoted by $P \wedge Q$.

$P \wedge Q$ is true if _____ of P and Q _____ true; otherwise, $P \wedge Q$ is false.

e.g., P_1 : the integer 2 is even. P_2 : the integer 34 is prime.

$P_1 \wedge P_2$:

which is _____ since

(2.3 cont.)

Ex How would you write each of these statement using combinations of " e " (meaning "Sue is an English major") and " j " (meaning "Sue is a junior") with the operations \vee, \wedge , and \sim ?

1. Sue is a junior English major.
2. Sue is either an English major or she is a junior.
3. Sue is a junior, but she is not an English major.
4. Sue is neither an English major nor a junior.
5. Sue is exactly one of the following: an English major or a junior.