

Conjunction

Conjunction: A compound statement formed by combining two simple statements using word "and"

Symbol: \wedge

ex 1) p: It is raining.

q: Kate is wet.

$p \wedge q$: It is raining and Kate is wet.

$p \wedge \sim q$: It is raining and Kate is not wet.

$\sim(p \wedge q)$: It is not the case that it is raining and Kate is not wet

Truth Table for Conjunction:

p	q	$p \wedge q$
T	T	T
T	F	F
F	T	F
F	F	F

"And" is only True when both parts are true.

ex 2) p: x is odd

q: x is prime

x is odd and x is prime

$p \wedge q$:

When x = 3:

When x = 9:

When x = 2:

When x = 6:

p	q	$p \wedge q$
T	T	T

p	q	$p \wedge q$
T	F	F

p	q	$p \wedge q$
F	T	F

p	q	$p \wedge q$
F	F	F

ex 3) Truth Table for $\sim(p \wedge \sim q)$

p	q	$\sim q$	$p \wedge \sim q$	$\sim(p \wedge \sim q)$
T	T	F	F	T
T	F	T	T	F
F	T	F	F	T
F	F	T	F	T

ex 4) Three sentences are written below. The truth values are given for the first two sentences.

Determine whether the third sentence is true, is false, or has an uncertain truth value.

$\overset{T}{\text{Today is Friday}} \wedge \overset{F}{\text{I have soccer practice.}} = \overset{F}{\text{(False)}}$
 $\overset{T}{\text{Today is Friday.}} \quad \text{(True)}$
 $\overset{F}{\text{I have soccer practice.}} \quad \text{(?)}$

Ex 5) Three sentences are written below. The truth values are given for the first two sentences.

Determine whether the third sentence is true, is false, or has an uncertain truth value.

$\overset{F}{\text{Today is Monday}} \wedge \overset{F}{\text{the sun is shining.}} = \overset{F}{\text{(False)}}$
 $\overset{F}{\text{Today is Monday.}} \quad \text{(False)}$
 $\text{The sun is shining.} \quad \text{(?)}$
 uncertain