

TOPIC: LOGICAL CONNECTIVES

And Statements (Conjunctions)

- ◆ Two simple statements can be combined with the word 'and' to form statements called **conjunctions**.

New	Conjunctions
p : Giraffes have spots. q : Some lions have manes.	
Giraffes have spots and some lions have manes. =	

- ◆ Conjunctions are **true** when _____ statements are true. They are transitive, so $p \wedge q$ & _____ are the **same**.

EXAMPLE

Translate the following conjunctions into words or symbols. Then, determine the truth value.

p : Giraffes have spots. q : Some lions have manes.

(A) $q \wedge p$



(B) Giraffes don't have spots and some lions have manes.



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PRACTICE

Translate the following conjunctions from symbols to words. Then, determine the truth value.
 p : Ten is a whole number. q : Five is less than three. r : Two times seven is fourteen.

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|-----------------------|-----------------------|--------------------------------|------------------------|
| (A) $\sim p \wedge r$ | (B) $\sim q \wedge p$ | (C) $p \wedge \sim q \wedge r$ | (D) $\sim(p \wedge q)$ |
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PRACTICE

Translate the following conjunctions from words to symbols. Then, determine the truth value.
 p : All courses give tests. q : Some courses give homework. r : Some courses have textbooks.

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|--|---|---|--|
| (A) Some classes don't give tests and give homework. | (B) All courses don't give homework and don't have textbooks. | (C) All courses give tests, some courses give homework, and all courses don't have textbooks. | (D) It is not true that some courses have textbooks and give homework. |
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EXAMPLE

Translate the following statements from words to symbols.
 p : I tried my best. q : I lost the tennis match.

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| (A) I tried my best, yet I lost the tennis match. | (B) I lost the tennis match, but I tried my best. |
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TOPIC: LOGICAL CONNECTIVES

Or Statements (Disjunctions)

◆ Two simple statements can be combined with the word 'or' to form statements called **disjunctions**.

Recall	Conjunctions	New	Disjunctions
	p: Giraffes have spots. q: Some lions have manes. Giraffes have spots and some lions have manes. $p \wedge q$ True when <i>all</i> statements are true.		p: Giraffes have spots. q: Some lions have manes. Giraffes have spots or some lions have manes. $p \vee q$ True when _____ statement is true.

◆ Disjunctions are transitive, so $p \vee q$ and _____ are the **same**.

EXAMPLE

Translate the following disjunctions into words or symbols. Then, determine the truth value.
 p : Giraffes have spots. q : Some lions have manes.

(A) $q \vee p$

(B) Giraffes don't have spots or it is not true that some lions have manes.

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PRACTICE

Translate the following disjunctions from symbols to words. Then, determine the truth value.

p : Dogs purr. q : Mice squeak. r : Wolves howl.

(A) $\sim r \vee p$

(B) $\sim p \vee \sim q$

(C) $\sim p \vee \sim q \vee \sim r$

(D) $\sim(p \vee q)$

PRACTICE

Translate the following disjunctions from words to symbols. Then, determine the truth value.

p : All books have chapters. q : Some books have pictures. r : Some books have glossaries.

(A) Some books don't have chapters or some books have pictures.

(B) All books don't have pictures or don't have glossaries.

(C) All books have chapters, some books have pictures, or all books don't have glossaries.

(D) It is not true that all books have chapters or some books have pictures.

EXAMPLE

Translate the following into words or symbols. Then, determine the truth value.

p : Two is even. q : Twenty is divisible by 5. r : Ten is smaller than eight.

(A) $p \wedge r \vee q$

(B) Twenty is divisible by five and ten is not smaller than eight, or two is not even.