

Geometry

Chapter 2

Section 2-4

May 13-10:02 PM

Concepts

Deductive
Reasoning

Using logic and reason to form
conclusions based on given
statements or facts

Compound
Statement

Logical statement combining two
or more statements

Aug 18-2:23 PM

$x^2 = 144$ if and only if $x = 12$ or $x = -12$.

p: $x^2 = 144$

q: $x = 12$

r: $x = -12$

Sep 6-9:36 AM

Compound Statement

Compound Statement	How to Form It	Example	Symbols
conjunction	Connect two or more statements with <u>and</u> .	You will eat a sandwich and you will drink juice.	$s \wedge j$ You say "s and j."
disjunction	Connect two or more statements with <u>or</u> .	You will eat a sandwich or you will drink juice.	$s \vee j$ You say "s or j."

both parts are happening

And

at least one part is happening

Sep 10-8:49 PM

Compound Statement

$x^2 = 144$ if and only if $x = 12$ or $x = -12$.

$p: x^2 = 144$

$q: x = 12$

$r: x = -12$

Abbreviate the statement with symbols

$$p \leftrightarrow (q \vee r)$$

Sep 6-9:36 AM

r : The Cardinals win

s : The Braves win

$r \vee s$

The Cardinals win

OR

the Braves win

$r \wedge \sim s$

The Cardinals win

and

The Braves do

not win

$r \wedge s$

The Cardinals win

and

the Braves win

Sep 11-7:47 PM

r: The Cardinals win
 s: The Braves win
 t: The Cardinals make the playoffs

On the last day of the 2011 season, the cardinals needed the more than one thing to happen to make the playoffs.

$$\underline{(r \wedge \sim s)} \downarrow \rightarrow t$$

If the Cardinals win and the Braves do not win then
 The Cardinals make the playoffs!

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Identifying Parts of a Compound Statement

Jacob:

"If God will be with me and will keep me on this journey that I take, and will give me food to eat and garments to wear, and I return to my father's house in safety, then the Lord will be my God.

--Genesis 28: 20-21

$$((p \wedge q) \wedge (r \wedge s) \wedge t) \rightarrow u$$

Sep 11-7:56 PM

Take note

Property Law of Syllogism

Symbols
 If $p \rightarrow q$ is true
 and $q \rightarrow r$ is true,
 then $p \rightarrow r$ is true.

Sep 11-8:15 PM

Take note

Property Law of Detachment

Law
 If the **hypothesis** of a true conditional is true, then the **conclusion** is true.

Symbols
 If $p \rightarrow q$ is true
 and p is true,
 then q is true.

★ If someone lives in Columbia, they live in Boone County. Mr. Stratman lives in Boone County.

★ If a rectangle's length and width are the same then it is a square. In rectangle ABCD, AB = 3 yd and BC = 9 ft.

9ft

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Assume that the following statements are true.

1. If it is Tuesday, then Tom has art class.
2. If Julie has a soccer game, then it is Tuesday
3. If it is a weekday, then Sarah has homework.
4. If it is not Saturday, then Manuel does not have tennis practice.
5. Julie has a soccer game.

Use only the information given above. For each statement, write *must be true*, *may be true*, or *is not true*. Explain your reasoning.

1. Sarah has homework.
2. Tom has art class.
3. Manuel has tennis practice.

Sep 5-3:31 PM

"If the mouse steps on the mouse trap, the trap will spring."

The mouse stepped on the trap, and it sprung.

$T \rightarrow T$

Our statement is true!

The mouse stepped on the trap, and it didn't spring.

$T \rightarrow F$

Our statement was a lie! We said that if the mouse stepped on the trap would spring!

false

The mouse didn't step on the trap, and it sprung.

Our statement is still true. We didn't promise the trap wouldn't spring on occasions where there was no mouse.

true

The mouse didn't step on the trap, and it didn't spring.

Our statement is still true. We never promised a sprung trap whenever no mouse stepped on.

true

Sep 8-7:46 AM

Truth Tables

p	q	$p \vee q$	$p \wedge q$	$p \rightarrow q$
T	T	T	T	T
T	F	T	F	F
F	T	T	F	T
F	F	F	F	T

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p	q	$p \vee q$	$p \wedge q$
T	T	T	T

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r	$p \vee q$	$(p \vee q) \wedge r$	$(p \vee q) \rightarrow r$
T	T	T	T

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r	$p \wedge q$	$(p \wedge q) \rightarrow r$
T	T	T

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p	q	r	$p \vee q$	$p \wedge q$	$(p \vee q) \wedge r$	$(p \vee q) \rightarrow r$	$(p \wedge q) \rightarrow r$
T	T	T	T	T	T	T	T
T	T	F	T	T	F	F	F
T	F	T	T	F	T	T	F
T	F	F	T	F	F	F	T
F	T	T	T	F	T	T	T
F	T	F	T	F	F	F	T
F	F	T	F	F	F	T	T
F	F	F	F	F	F	F	F

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Homework

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