

# Lesson 2-2

## Conditional Statements Day 2

If two angles are vertical angles, then they are congruent

Hypothesis:

Conclusion:

True or False?

Make a Venn diagram

If it is cloudy outside, then it's raining

Hypothesis:

Conclusion:

True or False?

Make a Venn diagram

If two angles are complementary, they are congruent

Hypothesis:

Conclusion:

True or False?

Make a Venn diagram

### Related Conditionals

Definition	Symbols
A <input type="text"/> is a statement that can be written in the form "If $p$ , then $q$ ."	$p \rightarrow q$

### Related Conditionals

Definition	Symbols
The <input type="text"/> is the statement formed by exchanging the hypothesis and conclusion.	$q \rightarrow p$

**Related Conditionals**

Definition	Symbols
The <input type="text"/> is the statement formed by negating the hypothesis and conclusion.	$\sim p \rightarrow \sim q$

**Related Conditionals**

Definition	Symbols
The <input type="text"/> is the statement formed by both exchanging and negating the hypothesis and conclusion.	$\sim q \rightarrow \sim p$

T or F?

Conditional	If two angles are vertical angles, then they are congruent	
Converse		
Inverse		
Contra-Positive		

T or F?

Conditional	If it's cloudy, then it's raining	
Converse		
Inverse		
Contra-Positive		

T or F?

Conditional	If two angles are complementary, then they are congruent	
Converse		
Inverse		
Contra-Positive		

Cats have 4 paws		T or F?
Conditional		
Converse		
Inverse		
Contra-Positive		

Statement	Example	Truth Value	
Conditional			
Converse	If $\angle A$ is obtuse, then $m\angle A = 95^\circ$ .		
Inverse			
Contrapositive			

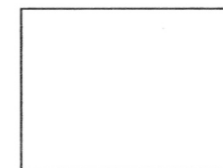
What can you determine about the truth of the conditional, converse, inverse, and contra-positive? What patterns do you see? Refer the previous 5 examples.

Related conditional statements that have the same truth value are called **logically equivalent statements**.

The  and  are logically equivalent  
 The  and  are logically equivalent

5. If you know  $q \rightarrow p$ , what other symbolic statement can you make? Explain.

7. In the box, draw a Venn diagram that conveys  $p \rightarrow q$  and  $q \rightarrow r$ . Describe it. Write at least two symbolic statements that you can infer using the diagram.



### Lesson Quiz: Part II

**Identify the hypothesis and conclusion of each conditional.**

4. Write the converse, inverse, and contrapositive of the conditional statement "If Maria's birthday is February 29, then she was born in a leap year."  
Find the truth value of each.