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

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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 _____ is a statement that can be written in the form "If $p$, then $q$." | $p \rightarrow q$ |

**Related Conditionals**

| Definition | Symbols |
|---|---|
| The _____ is the statement formed by exchanging the hypothesis and conclusion. | $q \rightarrow p$ |

**Related Conditionals**

| Definition | Symbols |
|---|---|
| The _____ is the statement formed by negating the hypothesis and conclusion. | $\sim p \rightarrow \sim q$ |

**Related Conditionals**

| Definition | Symbols |
|---|---|
| The _____ 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 $m\angle A = 95°$. | |
| 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 logiclaly 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.