

## 2.1 – 2.4 Quick Recap



### 2.1 Using Inductive Reasoning

**Inductive Reasoning:** is the process of using \_\_\_\_\_ to draw conclusions.

☐ You only need one \_\_\_\_\_ to disprove a conjecture.

**Example 1:** Determine if the conjecture is true. If not, give a counterexample.

“The difference of two negative numbers is a positive number”

### 2.2 Conditional Statements

**Conditional Statement:** An “if ..., then ...” statement.

The part following the “if” is called the \_\_\_\_\_ and the part following the “then” is called the \_\_\_\_\_.

**Example 2:** Write the statement as a conditional statement. Then circle the hypothesis and underline the conclusion.

“Mrs. Baker is on vacation in London.”

Conditional Statement: \_\_\_\_\_

### Types of Statements:

A _____ statement is a statement that can be written in the form “if p, then q.”	$p \rightarrow q$	
The _____ of a statement is formed by exchanging the hypothesis and conclusion.	$q \rightarrow p$	
The _____ of a statement formed by negating the hypothesis and conclusion. <b>Negation:</b> The negation of statement $p$ is “not $p$ ” written as $\sim p$	$\sim p \rightarrow \sim q$	
The _____ of a statement is formed by exchanging and negating the hypothesis and conclusion.	$\sim q \rightarrow \sim p$	

**Example 3:** Write the converse, inverse and contrapositive of the conditional statement. Then identify the truth value of each statement.

**Conditional:** "If two angles are complementary, then they are acute." T or F

**Converse:** \_\_\_\_\_ T or F

**Inverse:** \_\_\_\_\_ T or F

**Contrapositive:** \_\_\_\_\_ T or F

The conditional and its \_\_\_\_\_ have the same truth value.

### 2.3 Law of Syllogism

**Law of Syllogism:** If  $p \rightarrow q$  and  $q \rightarrow r$  are true statements, then  $p \rightarrow r$  is a true statement

\*The "q" statement needs to be the conclusion of one statement and the hypothesis of the other\*

**Example 4:** Given: If someone leaves their car lights on overnight, then their car battery will drain. If the battery is drained, their car might not start. If the car doesn't start, then they will be late for work. Make a conclusion based on the law of syllogism, if Alex left car lights on last night

Conclusion: \_\_\_\_\_

### 2.4 Biconditionals

A biconditional is one statement that contains a conditional and its \_\_\_\_\_.

In order for a biconditional to be true, both \_\_\_\_\_.

**Example 5:** Determine if the biconditional is true. If false, give a counterexample.

The number,  $x^2$ , is positive if and only if the number is positive