2.5 If-Then Statements and Deductive Reasoning (Day 1)

An <u>if-then statement</u> has two parts.

The 'if' part contains the <u>hypothesis</u>.

The 'then' part contains the <u>conclusion</u>.

Example 1: Identify the hypothesis and conclusion.

If I sleep through my alarm, then I will miss the school bus.

Example 2: Rewrite the statement as an if-then statement.

Every duck on the pond is hungry.

I will go running if it does not snow.

2.5 If-Then Statements and Deductive Reasoning (Day 2)

Deductive reasoning uses facts, definitions, accepted properties, and the laws of logic to make a logical arguement.

Law of Detachment: If the hypothesis of a true if-then statement is true, then the conclusion is also true.

Law of Syllogism:

If statement p, then statement q.

If statement q, then statement r.

If statement p, then statement r.

If these statements are true, then this statement is true.

Example 1: What can you conclude from the following true statements?

If you wash the cotton T-shirt in hot water, then it will shrink.

You wash the cotton T-shirt in hot water.

Conclusion: The cotton T-shirt will shrink.

Example 2: Checkpoint problems 3 and 4 on the bottom of pg. 83.

Example 3: Checkpoint in the middle of pg. 84.

Example 4: Write the statement that follows from the pair of true statements.

If the daily high temperature is 32 degrees F or less, then the water in the pipe is frozen.

If the water in the pipe is frozen, then the pipe will break.

Conclusion: If the daily high temperature is 32 degrees F or less, then the pipe will break.

Example 5: Checkpoint on the bottom of pg. 84.

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