**Math Reviewer**

**Logical Reasoning**

**Inductive Reasoning:**

* **Inductive Reasoning (Specific to General)** – A process of observing data, recognizing patterns, and making generalizations from observations. Unlike deductive reason, inductive reasoning makes use of specific statements to create general statements which is used to creating generalizations.
* **Conjecture** – A generalization of inductive reason, specifically an educated guess based on incomplete information, often used in math.
* **Theorem** – If a conjecture is proven in becomes a theorem.
* **Syllogism** - by utilizing deductive reasoning, you can draw conclusions based on a **major premise** (general statement), and **minor premise** (particular statement) which are accepted as true.
* **Deductive Reasoning (General to Specific)** – A kind of reasoning that starts from a general statement to a particular statement. From a general statement that has been accepted as true, you can create a specific statement which is mostly used proving statements.
* Specifically, by utilizing deductive reasoning, you can draw conclusions based on a **major premise** (general statement), and **minor premise** (particular statement) which are accepted as true. These comprise a **syllogism.**
* **Hypothesis** – A testable explanation for an explanation for an observation on a scientific question commonly used in science. It is tested through experiments and observations. If given enough data, it becomes a theory (A GAME THEORY!!!??!!?!?!).

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| **Example 1:** | **Legend:** |
| **Example 2:** | |
| **Example 3:** | |
| **Example 4:** | |

**Conditional Statements**

* **Hypothesis** – A testable statement or prediction about the relationship between variables.
* **Conclusion** – The final interpretation of results based on evidence from an experiment or study.
* A conditional statement has two parts: a hypothesis, and a conclusion. To write a conditional statement in symbols, we let be the hypothesis and be the conclusion. Now, the statement, *“If , then ”* can be written as:

**Transforming a Statement into an Equivalent If-then Statement:**

* Determine the appropriate hypothesis and conclusion for the statement.
* Express the hypotheses and the conclusion into the if-then form of a statement.
* Use appropriate pronouns or terms in constructing the conclusion part of the statement.

**Converse, Inverse, and Contrapositive:**

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| **Conditional Statement** | If p, then q | P > Q | If the snow is thick enough, then we can eat it. |
| **Converse** | If q, then p | Q > P | If we can eat the snow, then it is thick enough. |
| **Inverse** | If ~p, then ~q | ~P > ~Q | If the snow is not thick enough, then we cannot eat it. |
| **Contrapositive** | If ~q, then ~p | ~Q > ~P | If we cannot eat the snow, then it is not thick enough. |

**Deductive and Inductive Reasoning:**

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