A Brief Summary of Logic and Reasoning

Logic is the study of the principles or rules for valid & consistent reasoning. (Webster’s Dictionary)
Reasoning is the capacity for rational thought, inference, or discrimination. (Webster’s Dictionary)

Types of Reasoning:

- **Inductive Reasoning**: (Specific to General) Many examples leading to a general conclusion.
  
  Example: Many examples leading (convincing) to a general conclusion.

- **Deductive Reasoning**: (General to Specific) General statement leading to specific conclusions.
  
  Example: A sequence of steps leading (convincing) to a specific conclusion.

Types of Deductive Statements:

- **Conditional**: If (Given Information) then (Statement to be Proved)
  
  Hypothesis | Conclusion
  --- | ---
  If A = B | Then A + C = B + C
  **Converse**: If A + C = B + C | Then A = B
  **Inverse**: If A <> B | Then A + C <> B + C
  **Contrapositive**: If A + C <> B + C | Then A <> B

**Rectangle of Reason** implies that proving two diagonal statements proves all four statements.

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<th>Converse</th>
<th>Conditional</th>
<th>Contrapositive</th>
<th>Inverse</th>
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Types of Logical Situations:

- **Dichotomy Situation**: (Only Two Possibilities)
  
  Equal or Not Equal | True or False
  Guilty or Innocent | Male or Female

- **Trichotomy Situation**: (Only Three Possibilities)
  
  Greater Than | Equal | Less Than
  Always | Sometimes | Never
  True | Maybe | False
  Guilty | Innocent | No Contest

Types of Proofs: (Definition of Proof: Evidence or argument establishing the truth of a statement.)

- **Direct Proof**: Proves the Original Statement to be True.
  
  Proof by Testimonial | Proof by Analogy
  Proof by Induction | Proof by Deduction
  (TV Commercials use which type of proofs to convince you to buy their product.)

- **Indirect Proof**: Proves the Alternate Statement to be False.
  
  To use an Indirect Proof, one has to establish a Dichotomy or Trichotomy. (☹)
  
  (Many trial lawyers try to convince jury Guilty is not possible thus Innocent is true.)
  Many trial lawyers try to prove using Induction since many cases proves one case!


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