Background - In Syllogisms we were dealing with "TERM LOGIC."

Now we are going to deal with

Sentence Logic
Sentential Logic
Propositional Logic

Sentences, propositions ARE statements.

- **STATEMENTS**
  - SIMPLE STATEMENTS
  - ATOMIC STmts
  - Upper-Case Letters
  - **IF** you don't know
  - **IF** you don't know

- **COMPOUND STATEMENTS**
  - MOLECULAR STmts
  - Lower-Case Letters

How does one "get" compound statements?

What is a simple statement? (Example),

a. It is raining, \( R \): It is raining.
Jones gets wet, \( J \): Jones gets wet.

b. Compound Statements,
   - Not \( R \): It is not raining.
   - \( \sim R \): " " " " " "
   - \( \neg R \): " " " " " " (Negation)
   - Logical Connective
   - " & " conjunction
   - " " & " disjunction
   - " " & " implication
   - " " & " equivalence

ii. It is raining \( \lor \) Jones gets wet.
   \( R \lor J \)

iii. It is raining \( \land \) Jones gets wet.
   \( R \land J \)

iv. If it's raining, then Jones gets wet.
   \( R \rightarrow J \)

v. It is raining if and only if Jones gets wet.
   \( R \equiv J \)
   \( R \leftrightarrow J \)
Truth Tables to Define Meaning of the Operators.

**Negation**

<table>
<thead>
<tr>
<th>P</th>
<th>(~P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>F</td>
<td>T</td>
</tr>
</tbody>
</table>

**Dot (Conjunction)**

<table>
<thead>
<tr>
<th>P</th>
<th>Q</th>
<th>P &amp; Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>T</td>
</tr>
<tr>
<td>F</td>
<td>T</td>
<td>F</td>
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<tr>
<td>F</td>
<td>F</td>
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</tr>
</tbody>
</table>

P,Q are called "conjuncts"

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**AFTER CLASS**

**Wedge (Disjunction)**

<table>
<thead>
<tr>
<th>P</th>
<th>Q</th>
<th>(P \lor Q)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>T</td>
<td>F</td>
<td>T</td>
</tr>
<tr>
<td>F</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
</tbody>
</table>

The only instance where the disjunction is false is when BOTH DISJUNCTS are FALSE.

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To Be Continued...