Conditional Worksheet

- **Conditional statements are If …, then …. statements.**
- **They are in the form of If ,<some hypothesis>, then <some conclusion>.**
- **Please note the "IF" is not part of the hypothesis, but rather a flag waver telling you that the hypothesis is coming. The same is true for ", THEN ", it is not part of the conclusion, but rather telling you that the conclusion is coming.**
- **Sometimes the conclusion comes first followed by "if" and the hypothesis.**
- **We often use the symbol P for the hypothesis, and Q for the conclusion.**
- **In symbols, "If …., then …. ." is written P → Q.**

- **Identify the hypothesis and conclusion in each of the following statements.**

1) If today is Friday, then we have a test.

P: today is Friday Q: we have a test

2) If Sam misses more than 5 days, then he will have to take the final.

3) If Sue has not seen the movie, then we can not talk about it.

4) We will be out of school today, if it is snowing heavily.

P: it is snowing heavily Q: we will be out of school today

5) We will not watch a Disney movie, if we don't finish the chapter early.

- **Translate the 5 above sentences from English into symbols:**

1) $P \rightarrow Q$

2)

3) $\sim P \rightarrow \sim Q$

4)

5)

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- **We have three types of related conditional statements that are summarized below:**

	Symbols		EXAMPLE:
• **Conditional**	**P → Q**		○ **If the Seahawks win, then she will be happy**
• **Converse** **Co – Change Order**	**Q → P**	**Flips**	○ **If she is happy, then the Seahawks won.**
• **Inverse** **In – Insert Nots**	**~P → ~Q**	**Negates**	○ **If the Seahawks don't win, then she will not be happy.**
• **Contrapositive** **Cont – Change Order insert Nots**	**~Q→ ~P**	**Both**	○ **If she is not happy, then the Seahawks didn't win.**

- **If the conditional and the converse are both true, then we call it bi-conditional (goes both ways)**
  - **In symbols P ⟺ Q or P → Q and Q → P**
  - **All definitions are biconditional**
  - **A double arrow is read "if and only if"**

– **Examples:**

Angles are supplementary if and only if their measures add to 180.

Segments are congruent if and only if they have the same length.

Conditional Worksheet

Conditional	**If two angles are complementary, then they sum to 90°.**
Converse	
Inverse	
Contrapositive	
Conditional	
Converse	**If we get to leave early, then it is snowing at noon.**
Inverse	
Contrapositive	
Conditional	
Converse	
Inverse	**If it is not March, then its not March-madness.**
Contrapositive	
Conditional	
Converse	
Inverse	
Contrapositive	**If two angles are adjacent, then they are not vertical.**

Conditional Worksheet

Conditional	**If two lines are perpendicular, then their angle is right.**
Converse	
Inverse	
Contrapositive	
Conditional	
Converse	**If two angles are supplementary, then they sum to 180º**
Inverse	
Contrapositive	
Conditional	
Converse	
Inverse	**If today is not Friday, then we do not have a quiz.**
Contrapositive	
Conditional	
Converse	
Inverse	
Contrapositive	**If two angles aren't a linear pair, then they aren't supplementary.**