

Part Two

Basics:

- Conditional claim: any claim with the following structure: **If P, then Q.** where P and Q represent independent clauses. Symbolic form: $P \rightarrow Q$.
- Disjunctive claim: any claim with the following structure: **P or Q.** Symbolic form: $P \vee Q$.
- Basic argument forms:

The following are **VALID** forms.

Modus Ponens	Modus Tollens	Chain	Disjunctive	
$\frac{P \quad Q.}{P.} \quad \square \quad Q.$	$\frac{P \quad Q.}{\sim Q.} \quad \square \quad \square \quad P.$	$\frac{P \quad Q. \quad Q \quad R.}{P \quad R.} \quad \square \quad P \quad R.$	$\frac{P \vee Q. \quad \sim P.}{Q.} \quad \square \quad Q.$	$\frac{P \vee Q. \quad \sim Q.}{P.} \quad \square \quad P.$

The following are **INVALID** forms.

Denying the Antecedent	Affirming the Consequent	Reverse Chain	Disjunctive (invalid)	
$\frac{P \quad Q. \quad \sim P.}{\sim Q.} \quad \square \quad \sim Q.$	$\frac{P \quad Q. \quad Q.}{P.} \quad \square \quad P.$	$\frac{P \quad Q. \quad Q \quad R.}{R \quad P.} \quad \square \quad R \quad P.$	$\frac{P \vee Q. \quad P.}{\sim Q.} \quad \square \quad \sim Q.$	$\frac{P \vee Q. \quad Q.}{\sim P.} \quad \square \quad \sim P.$

I. Exercise: Identify which pattern matches the following simple arguments.

Sample: If it's raining, then the ground is wet. It is raining. Therefore, the ground is wet.

Make "it's raining" **P**. Make, "the ground is wet" **Q**. Now just fit the clauses into the pattern. Answer: Modus Ponens

1. If the OPEC countries increase oil production, then prices will fall. But the prices are not going to fall. Therefore, the OPEC countries are not going to increase oil production.
2. Either you did well in college or you will never make very much money. But you are making a lot of money. So you must have done well in college.
3. You either went to the movies or you went out to dinner. You went out to dinner. So you didn't go to the movies.
4. You spent too much on clothing. If you spent too much on clothing, then you won't have enough for rent. So, you won't have enough money for rent.

Exercise II: Below are some of the forms or patterns that are deductively valid. For each of the following arguments, if you pretend that the premises are true, the conclusion will be seen to follow necessarily from the premises. In each argument 1. Isolate and label each clause, 2. fill in the conclusion that follows from the premises; then, in the right hand column, fill in the form or pattern of the argument, and 3. fill in the name of the form.

(Hint: **double negation** will come in handy. P is the same as $\sim\sim P$.)

<u>Argument</u>	<u>Form</u>	<u>Name of form</u>
A. The car is either a four or six cylinder model. <u>It's not a six cylinder.</u> <input type="checkbox"/>	_____	
B. Heather will either go to college or to work. <u>Heather is not going to college.</u> <input type="checkbox"/>	_____	
<u>If she goes to work, then she will save money.</u> <input type="checkbox"/>	_____	
<u>If she gets into drugs, she won't save her money.</u> <input type="checkbox"/>	_____	

Lesson: Arguments we give in prose form are often incompletely stated. In these incomplete arguments, premises, conclusions, or both, are implied, but not stated. When reconstructing a prose argument into logical form, in addition to writing down the explicit (stated) premises and/or conclusion, we should also provide and implicit (unstated but implied) premises or conclusion that will make the argument logically complete. In order to completely understand and evaluate a person's argument it is necessary to reconstruct it completely, i.e., to provide all of the premises and conclusion in the argument, both explicit and implicit.

A good rule of thumb in reconstructing arguments is to first determine the conclusion (explicit or implicit). The conclusion is often the easiest element to see in an argument. Once the conclusion is seen the premises of the argument will often be easier to figure out.

Exercise III: Following are some examples of incomplete arguments in prose form. Assuming they are all deductive (valid) arguments, reconstruct the arguments into logical form being sure to supply any implicit premises and/or conclusions that are needed to make the arguments logically complete. make sure you do not leave out any of the following steps. 1. Write out the argument with all of its premises and conclusion in a structure that matches the kind we've dealt with earlier. 2. Put parentheses around each independent clause. 3. Identify each clause with a letter. 4. Put the argument into its symbolic form. 5. Name the argument form (i.e., modus ponens, etc.). 6. Place square brackets around implicit premises or conclusions.

Example: Naturally the streets are wet, it's been raining.

<u>Reconstruction into logical form: Premises and Conclusion.</u>		<u>Form</u>	<u>Name</u>
A	B		
(1) [If (it's been raining), then (the streets are wet).]		If A, then B	M.P.
(2) <u>(It's been raining.)</u>		<u>A</u>	
(3) <input type="checkbox"/>	(the streets are wet.)	<input type="checkbox"/> B	

1. I was let to understand the Porsche or the Ferrari was available. Now I see I'll have to take the Porsche.
2. Playing golf means missing the concert. Surely you don't want to miss the concert.

3. When I listen carefully I can understand you and we get along fine when I understand you. Hence, we're getting along fine.
4. Of course Jeremy is honest. Aren't all Quakers?
5. Of course I'm sure, I read it in Business Week magazine.
6. Buying what I don't need will bring only short-termed satisfaction. I avoid spending frivolously. Hence, my satisfactions are always long-termed.
7. Anyone capable of learning has the means to relieve their ills. John will undoubtedly get better.
8. If you tell lies frequently, then you must remember not only what you have done but also what you said you have done. Therefore, if you tell lies frequently, your memory becomes burdened.
9. Nobody who sides with the enemy is a loyal friend. Maurice must not be a loyal friend.
10. The Western industrialized nations will resolve the energy crisis if they mobilize all the technological resources at their disposal. If financial incentives are sufficiently high, then the mobilization of resources will occur. The skyrocketing cost of energy has produced just such sufficiently high financial incentives. The conclusion is clear.
11. If you're so smart, then how come you're not rich?