

## IV. Hypothetical Syllogism

### A. General Form

If  $p$  then  $q$

If  $q$  then  $r$

Therefore, if  $p$  then  $r$

### B. Example

Persistence leads to success.

Success leads to wealth and power.

So if I am persistent, I shall obtain wealth and power.

### C. Alternate forms

1. If  $q$  then  $r$

If  $p$  then  $q$

Therefore, if  $p$  then  $r$

That is, the two premises may be in opposite order.

Example:

Tyranny is the most desirable form of government.

Democracy is tyranny.

Therefore, democracy is the most desirable form of government.

2. All  $p$  is  $q$

All  $q$  is  $r$

Therefore, all  $p$  is  $r$

Example:

All squares are rectangles.

All rectangles are quadrilaterals.

Therefore, all squares are quadrilaterals.

3. If  $p$  then  $q$

If  $q$  then  $r$

If  $r$  then  $s$

Therefore, if  $p$  then  $s$

That is, the number of premises or "links in the chain" may be more than two.

Example:

If I take the earlier flight, then I can meet with George.

If I meet with George, he can suggest a way out of my financial difficulties.

If George suggests a way out of my financial difficulties, then I can keep my car.

So if I take the earlier flight, I can keep my car.

4. If  $p$  then  $q$

If  $q$  then  $r$

$p$

Therefore,  $r$

Example:

If the Cavaliers beat the Warriors, then the Cavaliers win the championship.

If the Cavaliers win the championship, Cleveland's 52-year streak without a championship will end.

(Continue next page.)

The Cavaliers did beat the Warriors.  
Therefore, Cleveland's 52-year streak is over.

**D. Additional examples**

1. Teacher to student: "You know, Melanie, if you'd pay attention in class, you'd learn the material. And if you learn the material, you'll do better on the tests. And that will give you a better grade in this course. So start paying better attention in class and watch your grade go up."
2. No Republicans are radicals.  
Some union members are Republicans.  
Therefore, some union members are not radicals.

**E. Fallacy Associated with the Hypothetical Syllogism**

**Merging Consequents Fallacy**

General Forms

If $p$ , then $q$	If $p$ , then $q$
If $p$ , then $r$	If $p$ , then $r$
Therefore, if $q$ then $r$	Therefore, if $r$ then $q$

Example of the Fallacy

If a quadrilateral is a rhombus, all four sides are congruent.  
If a quadrilateral is a square, all four sides are congruent.  
Therefore, every rhombus is a square.

Explanation: A square is a kind of rhombus that not only has four congruent sides but also four congruent angles. So a rhombus without congruent angles is not a square.

**PRACTICE EXERCISES**

1. I'm all for President Trump's ban on Muslim immigrants, especially from Syria. Everybody knows all Syrians are Muslims, and all Muslims are terrorists. So if they're from Syria, they're terrorists. Keep them out!

Translation:

If \_\_\_\_\_, then \_\_\_\_\_.

If \_\_\_\_\_, then \_\_\_\_\_.

Therefore, if \_\_\_\_\_, then \_\_\_\_\_.

Is the reasoning valid? \_\_\_\_\_

2. Term papers interfere with the pleasures of academic life, and anything that interferes with the pleasures of academic life should be abolished. Therefore, one thing that should be abolished is term papers.

Is the reasoning valid? \_\_\_\_\_

### Answers to Completions

1. I'm all for Donald Trump's ban on Muslim immigrants, especially from Syria. Everybody knows all Syrians are Muslims, and all Muslims are terrorists. So if they're from Syria, they're terrorists. Keep them out!

Translation:

If you are Syrian, then you are Muslim.

If you are Muslim, then you are a terrorist.

Therefore, if you are Syrian, then you are a terrorist.

Is the reasoning valid? Yes

2. Term papers interfere with the pleasures of academic life, and anything that interferes with the pleasures of academic life should be abolished. Therefore, one thing that should be abolished is term papers.

Is the reasoning valid? \_\_\_\_\_

### Your Notes for Hypothetical Syllogism