

# PodClass Handout Week 6

## Deductively Valid Argument Forms

### **Modus Ponens (affirm by affirming)**

If she weighs the same as a duck, then she is a witch.  
She weighs the same as a duck.  
Therefore, she is a witch.

$P \rightarrow Q$   
 $P$   
 $\therefore Q$

### **Modus Tollens (deny by denying)**

If she weighs the same as a duck, then she is a witch.  
She is **not** a witch.  
Therefore, She does **not** weight the same as a duck.

$P \rightarrow Q$   
 $\sim Q$   
 $\therefore \sim P$

If it is raining outside, then the streets are wet.  
The streets are **not** wet.  
Therefore, it is **not** raining outside.

$P \rightarrow Q$   
 $\sim Q$   
 $\therefore \sim P$

### **Hypothetical syllogism**

If you have fear, then you have anger.  
If you have anger, then you have hate.  
If you have hate, then you will suffer.  
If you suffer, then you will turn to the dark side.  
Therefore, if you have fear, then you will turn to the dark side.

$A \rightarrow B$   
 $B \rightarrow C$   
 $C \rightarrow D$   
 $D \rightarrow E$   
 $\therefore A \rightarrow E$

### **Disjunctive Syllogism**

Either La La Land won best picture in 2017 or Moonlight did.  
La La Land did not win best picture in 2017.  
Therefore, Moonlight won best picture in 2017.

$A \vee B$   
 $\sim A$   
 $\therefore B$

Either La La Land won best picture in 2017 or Moonlight did.  
Moonlight won best picture in 2017. **INVALID ARGUMENT!**  
Therefore, La La Land did not win best picture in 2017.

$A \vee B$   
 $B$   
 $\therefore \sim A$

Either there will be cake at the party or there will be ice cream  
There is no ice cream at the party  
Therefore, there will be cake at the party.

$A \vee B$   
 $\sim A$   
 $\therefore B$

### **Dilemma**

You can have a vodka or gin drink  
If I drink vodka, I start acting rude  
If I drink gin, I start acting pretentious  
Therefore, I am going to be rude or pretentious

$P \vee Q$   
 $P \rightarrow R$   
 $Q \rightarrow S$   
 $\therefore R \vee S$

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Either I will go to the party or I will stay home and watch Netflix	$P \vee Q$
If I will go to the party, then I won't get my work done	$P \rightarrow R$
If I stay home and watch Netflix, then I won't get my work done	$Q \rightarrow S$
Therefore, I won't get my work done, or I won't get my work done	$\therefore R \vee S$

### Reductio Ad Absurdum (reduce to absurdity)

Suppose for argument sake that the earth was flat.  
If it was, then people would fall off the edge.  
No one ever falls off the edge of the earth.

So, the earth cannot be flat.

To prove  $\sim P$

Assume the opposite: P

Argue that P leads to Q

Show that Q is absurd or forms a contradiction or generally unacceptable result

Conclude that  $\sim P$  must be true after all

### Invalid Argument Forms

#### Affirming the Consequent

If there is fire, then there is oxygen.

There is oxygen.

Therefore, there is fire.

$P \rightarrow Q$

Q

$\therefore P$

If you got into law school, then you took the LSAT.

You took the LSAT.

Therefore, you got into law school.

$P \rightarrow Q$

Q

$\therefore P$

#### Denying the Antecedent

If there is fire, then there is oxygen.

There is no fire.

Therefore, there is no oxygen.

$P \rightarrow Q$

$\sim P$

$\therefore \sim Q$

If you got into law school, then you took the LSAT.

You did not get into law school.

Therefore, you took the LSAT.

$P \rightarrow Q$

$\sim P$

$\therefore \sim Q$

INVALID ARGUMENT!