

# Homework 5, Section 1.6: 3, 4, 5, 7

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## Homework

### 3. A)

The line of reasoning is invalid because of the converse fallacy

### 3. B)

The line of reasoning is valid because of Modus Tollens

### 3. C)

The line of reasoning is valid because of Modus Ponens

### 4. A)

If you read the book, then you will pass the course.

### 4. B)

If you will pass the course, then you must read the book.

### 4. C)

If you will pass the course, then you must read the book.

### 5. A)

If you want a refund, then you need a receipt.

### 5. B)

If you can pronounce "Euler", then you can grasp someone's mathematics background.

### 5. C)

If you are 16 years old, then you are legally driving in Pennsylvania.

**5. D)**

If you study Descartes, then you understand the history of calculus

**5. E)**

If you want to stay dry outside, then you need to carry an umbrella

**5. F)**

If you like horror stories, then Stephen King is fun to read.

**7. A)**

p	q	r	$(p \rightarrow (q \wedge r)) \vee ((p \wedge q) \rightarrow r)$
T	T	T	T
T	T	F	F
T	F	T	T
T	F	F	T
F	T	T	T
F	T	F	T
F	F	T	T
F	F	F	T

This expression is neither a tautology or a contradiction.

**7. B)**

p	q	r	$((p \rightarrow q) \wedge (q \rightarrow \neg p)) \rightarrow \neg p$
T	T	T	
T	F	T	
F	T	T	
F	F	T	

This expression is a tautology.

**7. C)**

p	q	r	$((p \rightarrow q) \wedge (\neg p \rightarrow r)) \rightarrow (q \vee r)$
T	T	T	T
T	T	F	T
T	F	T	T
T	F	F	T
F	T	T	T
F	T	F	T
F	F	T	T
F	F	F	T

This expression is a tautology.