Truth Tables for If-Then Conditional Statements

Name _____

Date _____ Period _____

Conditional Statement

$p \rightarrow q$

Hypothesis p	Conclusion q	Condition Statement $p \rightarrow q$
True	True	
True	False	
False	True	
False	False	

If the Hypothesis is True and the Conclusion is False,
then the Conditional Statement is False.

Truth Table for Conditional

$p \rightarrow q$

p	q	$p \rightarrow q$
T	T	T
T	F	F
F	T	T
F	F	T

Truth Table for Converse

$q \rightarrow p$

q	p	$q \rightarrow p$
T	T	
F	T	
T	F	
F	F	

If the Hypothesis is True and the Conclusion is False,
then the Conditional Statement is False.

Truth Table for Conditional

$p \rightarrow q$

p	q	$p \rightarrow q$
T	T	T
T	F	F
F	T	T
F	F	T

Truth Table for Inverse

$\sim p \rightarrow \sim q$

p	q	$\sim p$	$\sim q$	$\sim p \rightarrow \sim q$
T	T			
T	F			
F	T			
F	F			

If the Hypothesis is True and the Conclusion is False,
then the Conditional Statement is False.

Truth Table for Conditional

$p \rightarrow q$

p	q	$p \rightarrow q$
T	T	T
T	F	F
F	T	T
F	F	T

Truth Table for Contrapositive

$\sim q \rightarrow \sim p$

p	q	$\sim p$	$\sim q$	$\sim p$	$\sim q \rightarrow \sim p$
T	T				
T	F				
F	T				
F	F				

If the Hypothesis is True and the Conclusion is False,
then the Conditional Statement is False.

Create a Truth Table for $(p \rightarrow \sim q) \rightarrow (q \rightarrow \sim p)$

p	q	$\sim q$	$p \rightarrow \sim q$
T	T		
T	F		
F	T		
F	F		

p	q	$\sim p$	$q \rightarrow \sim p$
T	T		
T	F		
F	T		
F	F		

If the Hypothesis is True and the Conclusion is False,
then the Conditional Statement is False.

Create a Truth Table for $(p \rightarrow \sim q) \rightarrow (q \rightarrow \sim p)$

$p \rightarrow \sim q$	$q \rightarrow \sim p$	$(p \rightarrow \sim q) \rightarrow (q \rightarrow \sim p)$
F	F	
T	T	
T	T	
T	T	

If the Hypothesis is True and the Conclusion is False,
then the Conditional Statement is False.