

# Mathematical Foundations for Computer Applications

## Conditional Statements

				Conditional		Contrapositive	
				↓		↓	
p	q	$\sim p$	$\sim q$	$p \rightarrow q$	$q \rightarrow p$	$\sim p \rightarrow \sim q$	$\sim q \rightarrow \sim p$
T	T	F	F	T	T	T	T
T	F	F	T	F	T	T	F
F	T	T	F	T	F	F	T
F	F	T	T	T	T	T	T
				↑		↑	
				Converse		Inverse	

# Mathematical Foundations for Computer Applications

## Conditional Statements

---

Here are some of the important findings regarding the table

- ✓ The conditional statement is **NOT** logically equivalent to its converse and inverse.
- ✓ The conditional statement is logically equivalent to its contrapositive. Thus,  $p \rightarrow q \equiv \sim q \rightarrow \sim p$ .
- ✓ The converse is logically equivalent to the inverse of the original conditional statement. Therefore,  $q \rightarrow p \equiv \sim p \rightarrow \sim q$ .