Using the concept of negation, a truth table can also be used to verify the converse, inverse, and contrapositive of a conditional statement, as shown below. Again, fill in the blanks with your teacher. The values you found in the previous table have already been filled in.

P	Q	$\neg P$	$\neg Q$	$P \Rightarrow Q$ original cond. statement	$Q \Rightarrow P$ converse	$\neg P \Rightarrow \neg Q$ inverse	$\neg Q \Rightarrow \neg P$ contrapositive
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

***Notice that the table confirms what we have already seen: If a conditional statement is true, the contrapositive is true; and if the converse is true, the inverse is true.*

Example 1

Complete the truth table shown below. (This question is from the January 2016 Provincial Exam.)

p	q	$\sim q$	$p \Rightarrow \sim q$
True	True	F	F
True	False	T	T
False	True	F	T
False	False	T	T

Example 2

What values of m and n correctly complete the following truth table? (This question is from the June 2015 Provincial Exam)

p	q	$p \rightarrow q$
True	True	True
True	False	m F
False	True	n T
False	False	True