

Example 3: Translate this argument to symbolic form and construct the truth table and determine if it is a valid argument or not.

If it rains, then the concert will be delayed.
 The concert was delayed, therefore it rained.

$$\left[(P \rightarrow Q) \wedge Q \right] \xrightarrow{\text{Therefore}} P$$

P	Q	$(P \rightarrow Q)$	$[(P \rightarrow Q) \wedge Q]$	$\rightarrow P$
T	T	T	T	T
T	F	F	F	T
F	T	T	T	F
F	F	T	F	T

not
Valid

Example 4: Translate this argument to symbolic form and construct the truth table and determine if it is a valid argument or not.

P
 Q

If you miss the final exam, then you will get a zero for the exam

and

If you get zero in the final exam, then you will not pass the course.

and

You did not miss the final exam, therefore you will pass

$$\left[(P \rightarrow Q) \wedge (Q \rightarrow \sim R) \wedge \sim P \right] \rightarrow R$$

not valid

P	Q	R	$\sim P$	$\sim R$	$(P \rightarrow Q)$	$(Q \rightarrow \sim R)$	$(P \rightarrow Q) \wedge (Q \rightarrow \sim R) \wedge \sim P$	R
T	T	T	F	F	T	F	F	T
T	T	F	F	T	T	T	T	T
T	F	T	F	F	F	T	F	T
T	F	F	F	T	F	T	F	T
F	T	T	T	F	T	F	F	T
F	T	F	T	T	T	T	T	\textcircled{F}
F	F	T	T	F	T	T	T	T
F	F	F	T	T	T	T	T	\textcircled{F}

Example 5: Translate this argument to symbolic form:

$P \iff (I \vee R)$
The alarm will sound if and only if smoke or carbon monoxide is in the house

$\sim R$
There is no carbon monoxide in the house

Therefore, the alarm will sound if and only if smoke is in the house

$\implies P \iff I$

$$[P \iff (I \vee R) \wedge \sim R] \implies P \iff I$$