

Quiz 1

1. Determine whether the following argument form is valid or not by using the truth table.

People like swimming or swimming is hard. People like swimming if and only if swimming is not hard. Therefore, swimming is not hard.

Answer:

Let p be "People like swimming" and q be "Swimming is hard."

The above argument can be written in the following form.

$$p \vee q$$

$$p \leftrightarrow \sim q$$

$$\therefore \sim q$$

Truth table:

p	q	$p \vee q$	$p \leftrightarrow \sim q$	$\sim q$
T	T	T	F	
T	F	T	T	T
F	T	T	T	F
F	F	F	F	

←-- critical row

←-- critical row: **This has true premises & false conclusion.**

Notice that the columns 3 and 4 consist of the truth values of premises. Since the third row (which is a critical row) has true premises with false conclusion, then this argument is **invalid**.

