

Solution: Quiz 1 (2)

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

I eat vegetable or I am not healthy. If I eat vegetable, then I am healthy. Therefore, I am healthy if and only if I eat vegetable.

Answer:

Let p be “I eat vegetable” and q be “I am healthy.”

The above argument can be written in the following form.

$$p \vee \sim q$$

$$p \rightarrow q$$

$$\therefore q \leftrightarrow p$$

Truth table:

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

←-- critical row

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The critical rows are rows 1 and 4. Since all rows with true premises (critical rows) have true conclusion, then this argument is **valid**.

