

Home Page Checker Bonus Question:

If I get a headache, then I take a nap.
If I eat candy then I get a headache.
Therefore, if I eat candy, then I take a nap.

Write the following argument symbolically by first defining the propositions (using p, q, r, \dots).

p = "I get a headache" q = "I take a nap" r = "I eat candy"

then show the steps using the rule(s) of inference to prove the argument's validity.

$$\begin{array}{l} p \rightarrow q \\ r \rightarrow p \\ \hline \therefore r \rightarrow q \end{array} \quad \left. \vphantom{\begin{array}{l} p \rightarrow q \\ r \rightarrow p \\ \hline \therefore r \rightarrow q \end{array}} \right\} \text{Hypothetical Syllogism}$$

Finally use a truth table as well to prove the argument is valid

p	q	r	$p \rightarrow q$	$r \rightarrow p$	$r \rightarrow q$	$A \wedge B$	C
T	T	T	T	T	T	T	T
T	T	F	T	T	T	T	T
T	F	T	F	T	F	T	F
T	F	F	F	T	T	T	T
F	T	T	T	F	T	F	T
F	T	F	T	T	T	T	T
F	F	T	T	F	F	F	T
F	F	F	T	T	T	T	T

Therefore the argument is invalid.