Show All Solutions

Rosen, Discrete Mathematics and Its Applications, 7th edition
Extra Examples
Section 1.6—Rules of Inference

Extra Examples — *Page references correspond to locations of Extra Examples icons in the textbook.*

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p.73, icon at Example 6
#1. The proposition $(\neg q \wedge (p \to q)) \to \neg p$ is a tautology, as the reader can check. It is the basis for the rule of inference *modus tollens*:

$$\begin{array}{l} \quad \neg q \\ \quad p \to q \\ \hline \therefore \neg p \end{array}$$

Suppose we are given the propositions: "If the class finishes Chapter 2, then they have a quiz" and "The class does not have a quiz." Find a conclusion that can be drawn using modus tollens.

See Solution

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p.73, icon at Example 6
#2. Suppose that "it is snowing" is true and that "it is windy" is true. Using the conjunction rule, what conclusion can be drawn?

See Solution

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p.73, icon at Example 6
#3. Suppose "I have a dime or a quarter in my pocket" and "I do not have a dime in my pocket." According to the disjunctive syllogism rule, what can we conclude?

See Solution

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p.73, icon at Example 6
#4. Determine whether this argument is valid by using a truth table:

I play golf or tennis.

If it is not Sunday, I play golf and tennis.
If it is Saturday or Sunday, then I don't play golf.
Therefore, I don't play golf.

See Solution

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p.73, icon at Example 6

#5. Determine whether this argument is valid:

Lynn works part time or full time.
If Lynn does not play on the team, then she does not work part time.
If Lynn plays on the team, she is busy.
Lynn does not work full time.
Therefore, Lynn is busy.

See Solution

p.74, icon at Example 8
#1. Suppose we have the two propositions (with symbols to represent them):

"It is raining (r) or I work in the yard (w)"
"It is not raining ($\neg r$) or I go to the library (l)."

What conclusion can we draw from these propositions?

See Solution

p.76, icon at Example 12
#1. Suppose we have:

"Every student in this class is a Junior."
"Every Junior in this class passed the final exam."
"Allen is a student in this class."

Explain why we can draw the conclusion "Allen passed the final exam."

See Solution