Show All Solutions

**Rosen, Discrete Mathematics and Its Applications, 7th edition**
**Extra Examples**
**Section 1.2—Applications of Propositional Logic**

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

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**p.17, icon at Example 1**
**#1.** Suppose $u$ represents "you understand the material", $s$ represents "you study the theory", and $w$ represents "you work on exercises". Write the following compound proposition using $u$, $s$, $w$, and appropriate connectives.

"You study the theory and work on exercises, but you don't understand the material."

See Solution

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**p.17, icon at Example 1**
**#2.** Suppose $u$ represents "you understand the material" and $s$ represents "you study the theory". Write the following compound proposition using $u$, $s$, and appropriate connectives.

"Studying the theory is sufficient for understanding the material."

See Solution

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**p.17, icon at Example 1**
**#3.** Suppose $s$ represents "you study the theory" and $w$ represents "you work on exercises". Write the following compound proposition using $s$, $w$, and appropriate connectives.

"In order to work on exercises, you need to study the theory."

See Solution

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**p.17, icon at Example 1**

**#4.** Suppose $u$ represents "you understand the material", $s$ represents "you study the theory", and $w$ represents "you work on exercises". Write the following compound proposition using $u$, $s$, $w$, and appropriate connectives.

"When you study the theory and work on exercises, you understand the material."

See Solution

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**p.17, icon at Example 1**

**#5.** Suppose $u$ represents "you understand the material", $s$ represents "you study the theory", and $w$ represents "you work on exercises". Write the following compound proposition using $u$, $s$, $w$, and appropriate connectives.

"You don't understand the material unless you study the theory and work on exercises."

See Solution

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**p.17, icon at Example 3**

**#1.** Translate this system specification into symbols:

"The online user is sent a notification of a link error if the network link is down."

See Solution

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**p.17 icon at Example 3**

**#2.** Translate this system specification into symbols:

"Whenever the file is locked or the system is in executive clearance mode, the user cannot make changes in the data."

See Solution

**p.17, icon at Example 3**

**#3.** Write these system specifications in symbols using the propositions

$v$: "The user enters a valid password,"

$a$: "Access is granted to the user,"

$c$: "The user has contacted the network administrator,"

and logical connectives. Then determine if the system specifications are consistent.

(i) "The user has contacted the network administrator, but does not enter a valid password."

(ii) "Access is granted whenever the user has contacted the network administrator or enters a valid password."

(iii) "Access is denied if the user has not entered a valid password or has not contacted the network administrator."

See Solution

**p.18, icon at Example 4**

**#1.** How would you do a Boolean search for the appropriate Web pages for each of these:

(a) hotels in New England.

(b) hotels in England.

(c) hotels in England or New England.

See Solution

**p.19, icon at Example 7**

**#1.** Suppose you have three cards: one red on both sides (red/red), one green on both sides (green/green), and one red on one side and green on the other side (red/green). The three cards are placed in a row on a table. Explain how to determine the identity of all three cards by selecting one card and turning it over.

See Solution

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**p.19 icon at Example 7**

**#2.** Another of Smullyan's puzzles poses this problem. You meet two people, $A$ and $B$. Each person either always tells the truth (i.e., the person is a knight) or always lies (i.e., the person is a knave). Person $A$ tells you, "We are not both truthtellers."

Determine, if possible, which type of person each one is.

See Solution