Show All Solutions

Rosen, Discrete Mathematics and Its Applications, 8th edition
Extra Examples
Section 12.1—Boolean Functions

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

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p.816, icon at Example 10
#1. Prove the idempotent law $x = x \cdot x$ using the other identities of Boolean algebra listed in Table 5 of Section 11.1 of the textbook.

See Solution

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p.816, icon at Example 10
#2. Prove the domination law $x \cdot 0 = 0$ using the other identities of Boolean algebra listed in Table 5 in Section 11.1 of the textbook.

See Solution

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p.816, icon at Example 10
#3. Using the properties of Boolean algebra, prove that

$$yz + x\overline{(xz)} + y(\overline{z} + 1) + \overline{z}x$$

can be simplified to give $y + \overline{z}x$.

See Solution

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Extra Examples
Section 12.2—Representing Boolean Functions

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

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p.820, icon at Example 3
#1. Find a Boolean function $f(x, y, z)$ that has the following element table:

x	y	z	$f(x, y, z)$
1	1	1	0
1	1	0	1
1	0	1	1
1	0	0	0
0	1	1	0
0	1	0	1
0	0	1	1
0	0	0	0

See Solution

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p.820, icon at Example 3
#2. Let $f(x, y, z) = \overline{z} + \overline{x}z$.

(a) Find the sum-of-products expansion (disjunctive normal form) for f.
(b) Find the product-of-sums expansion (conjunctive normal form) for f.

See Solution

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Extra Examples
Section 12.3—Logic Gates

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

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p.825, icon at Example 2
#1. Design a circuit that takes three inputs x, y, and z and produces a value 1 if and only if the input for x is 1 and exactly one of the inputs for y and z is 1.

See Solution
