12.2 Representing Boolean Functions

12.2 pg. 822 # 1

Find a Boolean product of the Boolean variables $x, y,$, and z, or their complements, that has the value 1 if and only if

a) $x = y = 0, z = 1$

b) $x = 0, y = 1, z = 0$

c) $x = 0, y = z = 1$

d) $x = y = z = 0$

12.2 pg. 822 # 3

Find the sum-of-products expansions of these Boolean functions.

a) $F(x, y, z) = x + y + z$

b) $F(x, y, z) = (x + z)y$

c) $F(x, y, z) = x$

d) $F(x, y, z) = x\bar{y}$

12.2 pg. 822 # 5

Find the sum-of-products expansion of the Boolean function $F(w, x, y, z)$ that has the value 1 if and only if an odd number of w, x, y, and z have the value 1.

12.2 pg. 822 # 11

Find the product-of-sums expansion of each of the Boolean functions in Exercise 3.

a) $F(x, y, z) = x + y + z$

b) $F(x, y, z) = (x + z)y$

c) $F(x, y, z) = x$

d) $F(x, y, z) = x\bar{y}$

12.2 pg. 822 # 13

Express each of these Boolean functions using the operators $+$ and $^-$.

a) $x + y + z$

b) $x + \bar{y}(\bar{x} + z)$

c) $\overline{x + \bar{y}}$

d) $\bar{x}(x + \bar{y} + \bar{z})$