Table 3–24

A	B	C	Z
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0

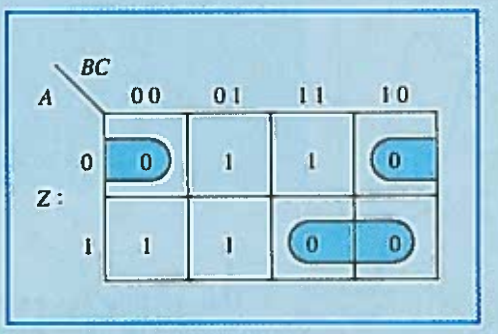

Figure 3–62
Using a K-map to convert from sum-of-products to product-of-sums form.

(b) To convert the equation

$$X = (P + Q)(R + \bar{S})$$

into sum-of-products form, the equation's truth table shown in Table 3–25 is first obtained. Next the truth table values are entered into the K-map shown in Figure 3–63.

From the K-map in Figure 3–63 we can now obtain the simplified sum-of-products equation

$$Z = PR + QR + P\bar{S} + Q\bar{S}$$

Table 3–25

P	Q	R	S	X
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	0
1	1	1	0	1
1	1	1	1	1