



Problem:

From the formula go to the truth table and use the table to construct the perfect CNF.

$$\bar{x} \vee (\overline{yz})x.$$

Solution:

$$f(x, y, z) = \bar{x} \vee (\overline{yz})x$$

Create the truth table for $f(x, y, z)$:

x	y	z	$\bar{x}$	yz	$\overline{yz}$	$(\overline{yz}) \cdot x$	$f(x, y, z)$
0	0	0	1	0	1	0	1
0	0	1	1	0	1	0	1
0	1	0	1	0	1	0	1
0	1	1	1	1	0	0	1
1	0	0	0	0	1	1	1
1	0	1	0	0	1	1	1
1	1	0	0	0	1	1	1
1	1	1	0	1	0	0	0

$\Rightarrow$

x	y	z	f
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	0

From the table we see that the PCNF of function $f(x, y, z)$ will be:

$$f(x, y, z) = \bigwedge_{f(a,b,c)=0} (x^a \vee y^b \vee z^c) = x^1 \vee y^1 \vee z^1 = \boxed{x^0 = \bar{x} \Rightarrow} = x^0 \vee y^0 \vee z^0 = \bar{x} \vee \bar{y} \vee \bar{z}. \text{ (i.e., the PCNF contains only 1 conjunction).}$$