Symbolic Procedure

Using algebraic manipulations obtain a logic diagram consisting of only nand-gates for each of the following Boolean expressions:

1. \( f(w, x, y, z) = \overline{y} + w\overline{x} + \overline{wxz} \)

2. \( f(w, x, y, z) = (w + y)(\overline{x} + \overline{z})(\overline{w} + \overline{x} + \overline{y}) \)
Graphical Procedure

Convert the following Boolean expressions into logic diagrams and using the graphical procedures, convert the logic diagram into a logic diagram consisting of only nand-gates.

1. \( f(w, x, y, z) = \overline{w}(xy + \overline{x}y) + z(x + y) \)

2. \( f(w, x, y, z) = (\overline{x} + yz)[w + (y + z)(\overline{y} + \overline{z})] \)