

## NAND Gate Realizations

9/28/15

### Symbolic Procedure

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

1.  $f(w, x, y, z) = \bar{y} + w\bar{x} + \bar{w}x\bar{z}$

2.  $f(w, x, y, z) = (w + y)(\bar{x} + \bar{z})(\bar{w} + \bar{x} + \bar{y})$

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### 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.  $f(w, x, y, z) = \overline{w}(x\overline{y} + \overline{x}y) + z(x + y)$

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