$$f(a,b,c,d) = \overline{a}\,\overline{b} + \overline{a}\,b\,\overline{d} + \overline{a}\,d + b\,c\,d + a\,c\,d = \overline{a}\,\overline{b} + \overline{a}\,\overline{d} + \overline{a}\,d + b\,c\,d + a\,c\,d = \overline{a}\,\overline{b} + \overline{a} + b\,c\,d + a\,c\,d = \overline{a} + b\,c\,d + a\,c\,d$$

De Morgan

$$\overline{a}\,\overline{b} + \overline{a}\,b\,\overline{d} = \overline{a}\left(\overline{b} + b\,\overline{d}\right) = \overline{a}\left(\overline{b} + b\right)\left(\overline{b} + \overline{d}\right) = \overline{a}\left(\overline{b} + \overline{d}\right) = \overline{a}\overline{b} + \overline{a}\overline{d}$$

$$\overline{a}\overline{d} + \overline{a}d = \overline{a}\left(\overline{d} + d\right) = \overline{a}$$

absorción $xy + x = x$

$$f(a,b,c,d) = \overline{a} + b\,c\,d + a\,c\,d = \overline{a} + c\,d + b\,c\,d = \overline{a} + c\,d = (\overline{a} + c)(\overline{a} + d) = \overline{\overline{(\overline{a} + c)(\overline{a} + d)}} = \overline{\overline{(\overline{a} + c)} + \overline{(\overline{a} + d)}}$$

$$\overline{a} + acd = (\overline{a} + a)\,(\overline{a} + cd\,) = \overline{a} + cd$$

$x + \overline{x} = 1$

$x + xy = x$ *absorción*

$x + yz = (x + y)(x + z)$ *distributiva*

$\bar{\bar{x}} = x$

$\overline{(x \cdot y)} = \overline{x} + \overline{y}$ *De Morgan*