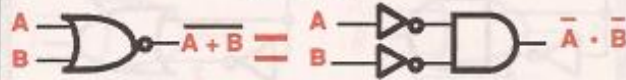


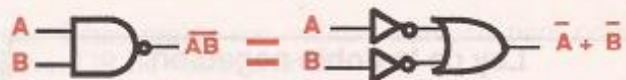
## Teoremas de DeMorgan

### Regla 21



$$\overline{A + B} = \overline{A} \cdot \overline{B}$$

### Regla 22



$$\overline{A \cdot B} = \overline{A} + \overline{B}$$

Fig. 127

## Obtención de otras compuertas a partir de compuertas NAND

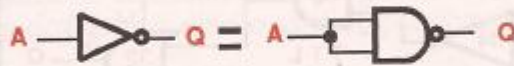
### AND



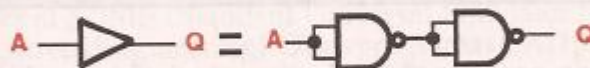
### OR



### NOT



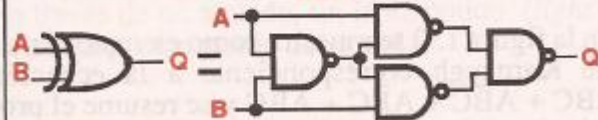
### YES



### NOR



### XOR



### XNOR

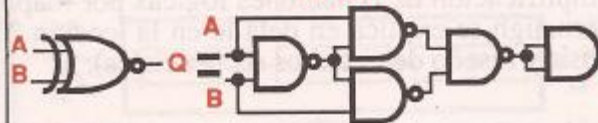
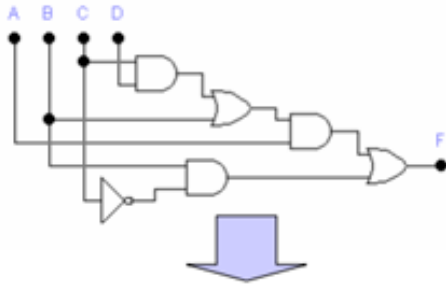


Fig. 128

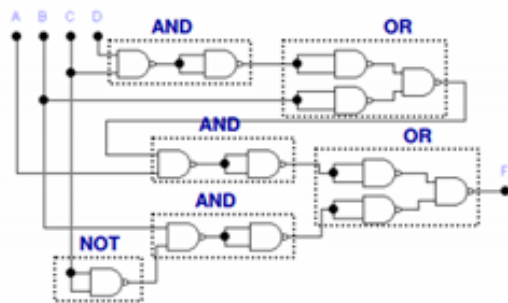
Ejemplo: implementación de un circuito lógico con compuertas NAND

$$F = A(B + CD) + BC'$$

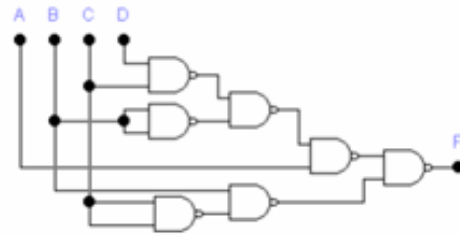
**PASO 1:** Implementación AND/OR/NOT



**PASO 2:** Sustitución con funciones equivalentes NAND



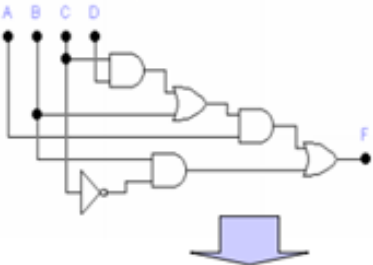
**PASO 3:** Eliminar los pares de inversores en cascada



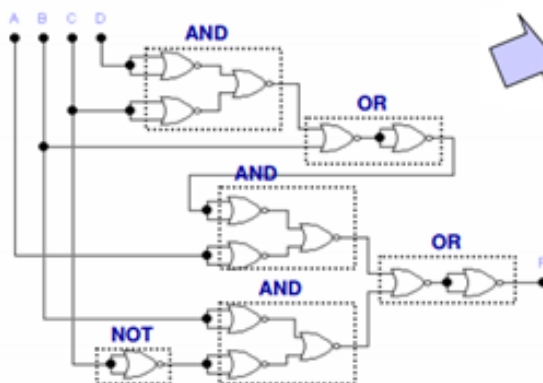
Ejemplo: implementación de un circuito lógico con compuertas NOR

$$F = A(B + CD) + BC'$$

**PASO 1:** Implementación AND/OR/NOT



**PASO 2:** Sustitución con funciones equivalentes NOR



**PASO 3:** Eliminar los pares de inversores en cascada

