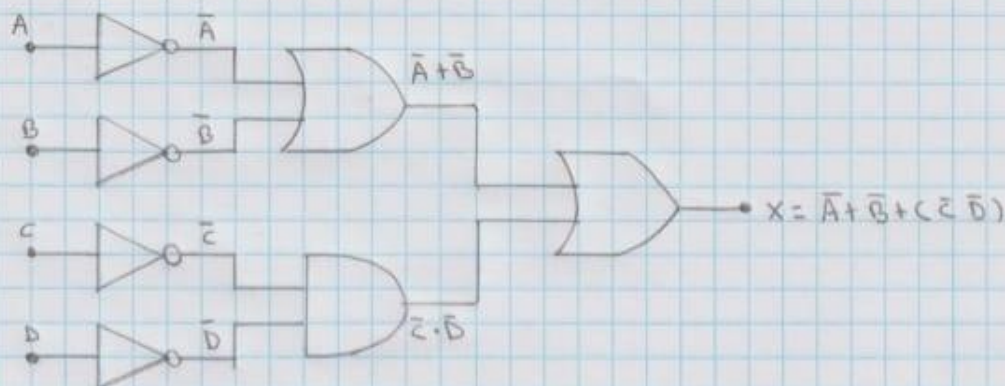
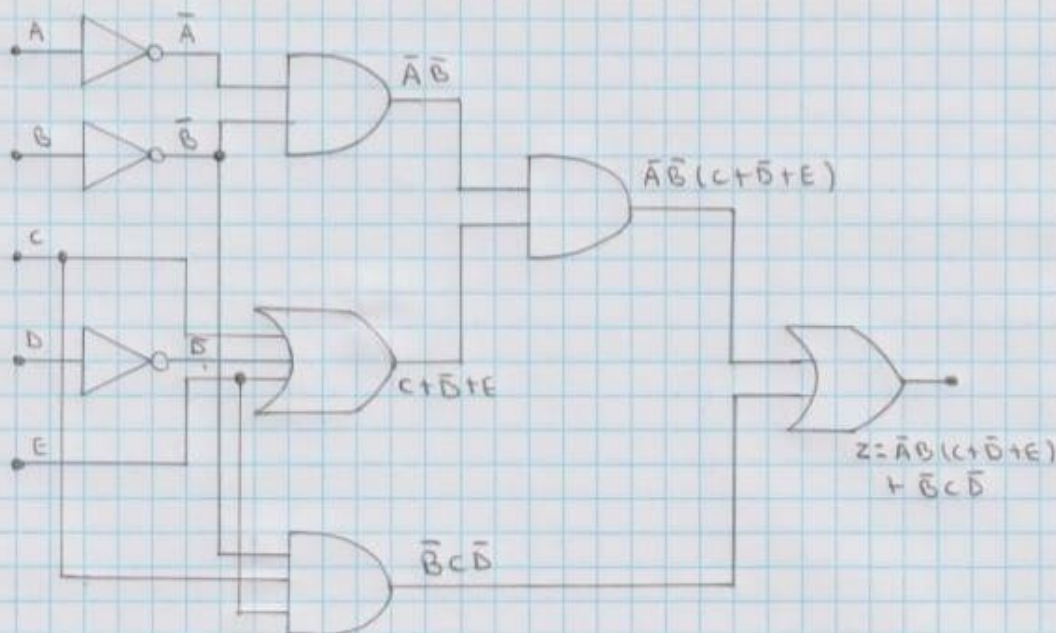


3-16. Para cada una de las siguientes expresiones, construya el circuito lógico correspondiente, utilizando puertas AND, OR e Inversores.

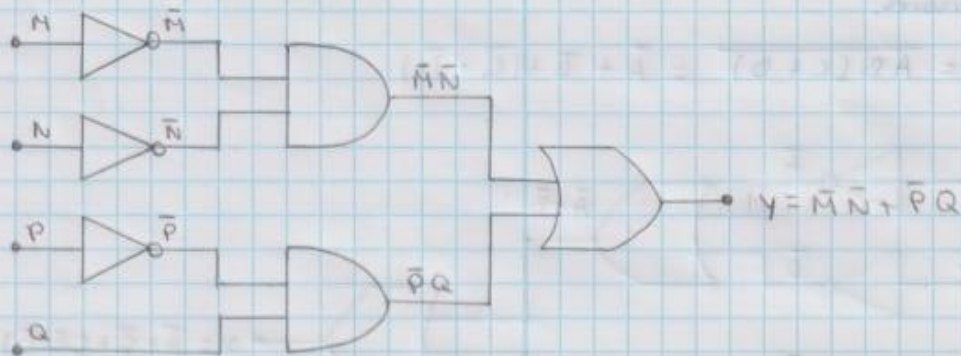
(a) $\star X = \overline{AB(C+D)} = \bar{A} + \bar{B} + (\bar{C} \cdot \bar{D})$



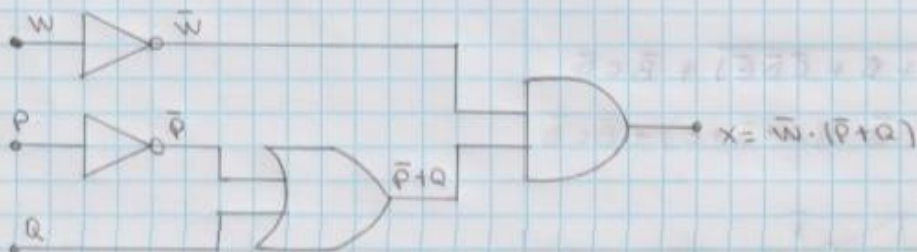
(b) $\star Z = \overline{(A+B+\bar{C}D\bar{E})} + \bar{B}C\bar{D}$
 $= \bar{A} \cdot \bar{B} \cdot (C + \bar{D} + E) + \bar{B}C\bar{D}$



$$(c) Y = \overline{(M + N + \bar{P}Q)} = \bar{M} \cdot \bar{N} + \bar{P} \cdot Q$$



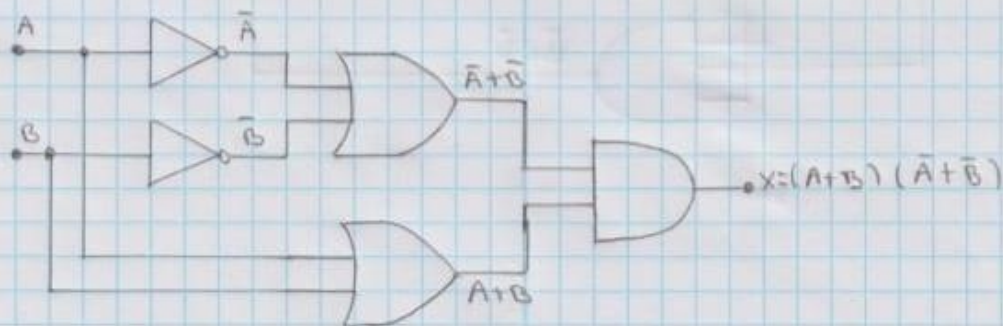
$$(d) X = \overline{W + P\bar{Q}} = \bar{W} \cdot (\bar{P} + Q)$$



$$(e) Z = MN(P + \bar{N}) \rightarrow Z = MNP + MN\bar{N} \rightarrow MNP + M(0) \rightarrow Z = M \cdot N \cdot P$$



$$(f) X = (A + B)(\bar{A} + \bar{B})$$



3-26 Simplifique cada una de las siguientes expresiones utilizando los teoremas de Morgan.

$$(a) \star \overline{ABC} = \overline{A} + \overline{B} + \overline{C} = A + \overline{B} + C \quad R_{11}$$

$$(b) \overline{A + BC} = \overline{A} \cdot \overline{(B \cdot C)} = A \cdot (\overline{B} + \overline{C}) \quad R_{11}$$

$$(c) \star \overline{AB\overline{C}\overline{D}} = \overline{A} + \overline{B} + \overline{\overline{C}} + \overline{\overline{D}} = \overline{A} + \overline{B} + C + D$$

$$(d) \overline{A + B} = \overline{A} \cdot \overline{B} = \overline{A \cdot B} \quad R_{11}$$

$$(e) \overline{\overline{AB}} = \overline{\overline{A} \cdot \overline{B}} = A \cdot B \quad R_{11}$$

$$(f) \overline{\overline{A} + \overline{C} + \overline{D}} = \overline{\overline{A}} \cdot \overline{\overline{C}} \cdot \overline{\overline{D}} = A \cdot C \cdot D \quad R_{11}$$

$$(g) \star \overline{A(B + \overline{C})D} = \overline{A \cdot B \cdot \overline{C} \cdot D} = \overline{A \cdot B \cdot C \cdot D} \\ = \overline{A} + \overline{B} + \overline{C} + \overline{D} = \overline{A + B + C + D} \quad R_{11}$$

$$(h) \overline{(M + \overline{N})(\overline{M} + N)} = \overline{(M + \overline{N}) + (\overline{M} + N)} = \overline{(M \cdot \overline{N}) + (\overline{M} \cdot N)} \\ = \overline{(\overline{M} \cdot N) + (M \cdot \overline{N})} = \overline{\overline{M}N + M\overline{N}} \quad R_{11}$$

$$(i) \overline{\overline{AB}CD} = \overline{(\overline{A + B})C} \rightarrow A \cdot B + \overline{C} \\ = \overline{(A \cdot B + \overline{C}) \cdot D} = \overline{A \cdot B + \overline{C} + D} = \overline{(\overline{A + B}) \cdot C + D} \\ = \overline{(\overline{A + B}) \cdot C} + \overline{D} \quad R_{11}$$