

$$A(\bar{B}\bar{C} + \bar{B}) \rightarrow AB\bar{C} + AB$$

$$A(\bar{C} + \bar{B}) + AB(\bar{C} + 1)$$

$$A\bar{C} + A\bar{B} + AB$$

$$A(\bar{C} + \bar{B} + B) = A(\bar{C} + 1) = A \cdot 1 = A \quad \checkmark$$

$$\bar{A}\bar{B}\bar{C}D + \bar{A}\bar{B}C + \bar{A}B + A$$

$$\bar{B}\bar{C}D + \bar{B}C + B + A$$

$$\bar{C}D + C + B + A = \underline{A + B + C + D} \quad \checkmark$$

$$\bar{A}B + A\bar{B} + \bar{A}\bar{B} + AB = 1$$

$$AB \text{ is } \neg(\neg A \wedge \neg B) \wedge (A \vee B) \text{ is } 1 \quad \checkmark$$

$$\bar{A}D + BCD + AB\bar{C}D$$

$$D(\bar{A} + BC + AB\bar{C}) = D(\bar{A} + BC + B\bar{C})$$

$$= D(\bar{A} + B(\underline{C + \bar{C}})) = \underline{D(\bar{A} + B)} \quad \checkmark$$

$$C + AB\bar{C} + A(B + \bar{C})$$

$$C + AB\bar{C} + AB = C + AB(\bar{C} + 1)$$

$$C + AB$$

$$\overline{ABC} + \overline{A+B+C} = \bar{A} + \bar{B} + \bar{C} + \bar{A}\bar{B}\bar{C}$$

$$= \bar{A} + \bar{B} + \bar{C}$$

$$A + \overline{B+C} + A(B+C) = A + \bar{B} + \bar{C} + \bar{A}(B+C)$$

$$A + \bar{B} + \bar{C} + \bar{A} = \bar{B} + \bar{C} + 1 = 1$$

$$\overline{AB(\bar{B} + C)} + \overline{ABC} = \bar{A} + \bar{B} + (\bar{B} + C) + \bar{A} + \bar{B} + \bar{C}$$

$$\bar{A} + \bar{B} + \bar{B} + C + \bar{C} = \bar{A} + \bar{B} + \bar{B} + C + \bar{C}$$

$$= \bar{A} + \bar{B} + \bar{C}$$

$$AB\bar{C} + AB = \overline{AB\bar{C}} \cdot \overline{AB}$$

$$(\bar{A} + \bar{B} + C)(\bar{A} + \bar{B}) = (\bar{A} + \bar{B} + C)(\bar{A} + \bar{B})$$

$$= \bar{A}\bar{A} + \bar{A}\bar{B} + \bar{B}\bar{A} + \bar{B}\bar{B} + C\bar{A} + C\bar{B}$$

$$\bar{A} + \bar{A}\bar{B} + \bar{B}\bar{A} + \bar{B} + C\bar{A} + C\bar{B} = \bar{A} + \bar{B}$$

$$\overline{A + Bc} = \overline{A + Bc} + A$$

$$\overline{A + Bc} + \overline{A} = \overline{A + Bc} + \overline{A} = \overline{A}$$

$$\overline{ABCD} = \overline{A + \overline{ABCD}}$$

$$\overline{ABCD} = A + \overline{ABCD}$$

$$(\overline{A + B + C + D})(A + \overline{ABCD})$$

$$(A + \overline{B} + \overline{C} + \overline{D})(A + \overline{ABCD}) = A + \overline{AB} + \overline{AC} + \overline{AD} + \overline{ABCD} + \overline{B} \overline{BCD} + \overline{C} \overline{BCD} + \overline{D} \overline{BCD} =$$

$$A + \overline{AB} + \overline{AC} + \overline{AD} + \overline{ABCD} + \overline{BCD} = A + \overline{BCD}$$

$$(\overline{AC} + \overline{BCD}) \overline{AD} + \overline{BCD} = \overline{ACD} + \overline{ABCD} + \overline{BCD}$$

$$\overline{ACD} + \overline{BCD} = \overline{A} + \overline{C} + \overline{D} + \overline{BCD} = A + C + \overline{D}$$