

Digital Logic Design Exercise

Rule 12, Boolean Algebra

Rule 12 states that $(A + B)(A + C) = A + BC$, can be proven by applying earlier rules. We can see this as follows:

$$\begin{aligned}(A + B)(A + C) &= AA + AC + AB + BC && \text{Distributive Law} \\ &= A + AC + AB + BC && \text{Rule 7: } AA = A \\ &= A(1 + C) + AB + BC && \text{Factoring (Distributive Law)} \\ &= A \cdot 1 + AB + BC && \text{Rule 2: } 1 + C = 1 \\ &= A(1 + B) + BC && \text{Factoring (Distributive Law)} \\ &= A \cdot 1 + BC && \text{Rule 2: } 1 + B = 1 \\ &= A + BC && \text{Rule 4: } A \cdot 1 = A\end{aligned}$$

Complete the Truth Table

A	B	C	A + B	A + C	(A + B)(A + C)	BC	A + BC
0							
0							
0							
0							
1							
1							
1							
1							

Draw the Logic Circuit Simplification