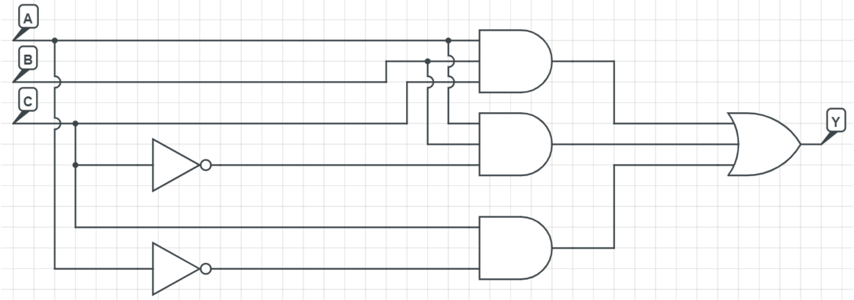
Tabelle verità 1- Traccia

a. **Costruire la tabella di verità della seguente espressione**

$$w = \overline{(x + y) \cdot z \cdot (y + z)}$$

b. **Dato il seguente circuito:**
   1. Calcolare (ed eventualmente semplificare) la funzione logica
   2. Calcolare la tabella di verità



Circuito - Traccia

a. **Disegnare il circuito logico corrispondente alla seguente funzione Booleana, senza semplificarla**

$$Y_1 = A \cdot \overline{(B + \bar{C})} + \overline{(B + \bar{C}) \cdot B}$$

b. **Data la funzione $Y_2 = \bar{A}BCD + ABCD + A\bar{B}CD$:**
   1. Disegnare circuito corrispondente
   2. Semplificare F usando proprietà e teoremi dell'Algebra di Boole.
   3. Disegnare nuovo circuito ottenibile da funzione semplificata

Table 2.2 Boolean theorems of one variable

	Theorem		Dual	Name
T1	$B \bullet 1 = B$	T1′	$B + 0 = B$	Identity
T2	$B \bullet 0 = 0$	T2′	$B + 1 = 1$	Null Element
T3	$B \bullet B = B$	T3′	$B + B = B$	Idempotency
T4		$\overline{\overline{B}} = B$		Involution
T5	$B \bullet \overline{B} = 0$	T5′	$B + \overline{B} = 1$	Complements

Table 2.3 Boolean theorems of several variables

	Theorem		Dual	Name
T6	$B \bullet C = C \bullet B$	T6′	$B + C = C + B$	Commutativity
T7	$(B \bullet C) \bullet D = B \bullet (C \bullet D)$	T7′	$(B + C) + D = B + (C + D)$	Associativity
T8	$(B \bullet C) + (B \bullet D) = B \bullet (C + D)$	T8′	$(B + C) \bullet (B + D) = B + (C \bullet D)$	Distributivity
T9	$B \bullet (B + C) = B$	T9′	$B + (B \bullet C) = B$	Covering
T10	$(B \bullet C) + (B \bullet \overline{C}) = B$	T10′	$(B + C) \bullet (B + \overline{C}) = B$	Combining
T11	$(B \bullet C) + (\overline{B} \bullet D) + (C \bullet D) = B \bullet C + \overline{B} \bullet D$	T11′	$(B + C) \bullet (\overline{B} + D) \bullet (C + D) = (B + C) \bullet (\overline{B} + D)$	Consensus
T12	$\overline{B_0 \bullet B_1 \bullet B_2 \ldots} = (\overline{B_0} + \overline{B_1} + \overline{B_2} \ldots)$	T12′	$\overline{B_0 + B_1 + B_2 \ldots} = (\overline{B_0} \bullet \overline{B_1} \bullet \overline{B_2} \ldots)$	De Morgan's Theorem

Semplificare le seguenti espressioni usando i Teoremi dell'algebra Booleana:

$$F_1 : \bar{A} \cdot \bar{B} \cdot \bar{C} + \bar{A} \cdot B + A \cdot B + A \cdot \bar{B} \cdot \bar{C}$$

$$F_2 : A \cdot B \cdot \bar{C} + A \cdot \bar{B} \cdot C + A \cdot B \cdot C$$

$$F_3 = A \cdot B \cdot C + \bar{A} + \bar{B} + \bar{C}$$

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Applicando i teoremi dell'algebra di Boole, verificare se la seguente espressione 'e vera o falsa:

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

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Dimostrare se la seguente uguaglianza è vera o falsa:

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

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Esercizio 1- Da tavola a forme POS/SOP

- Calcolare forme canoniche SOP e POS partendo dalla seguente tabella

A	B	C	Y
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

- Determinare tabella di verità e forme canoniche SOP e POS di una funzione a tre inputs che dà 1 in output sse riceve un numero pari di 1 in input