

3a) 9, 2, 5, 4, 8, 6, 1, 7, 3
or b).

Boolean Algebra:

Variables 0 or 1
F T

$B = \{0, 1\}$

Boolean mult •

x	y	$x \cdot y$
0	0	0
0	1	0
1	0	0
1	1	1

x	y	$x \wedge y$
F	F	F
F	T	F
T	F	F
T	T	T

Boolean Addition

x	y	$x + y$
0	0	0
0	1	1
1	0	1
1	1	1

x	y	$x \vee y$
F	F	F
F	T	T
T	F	T
T	T	T

Complement:

$$\overline{0} = 1$$

$$\overline{1} = 0$$

$$\neg F = T$$

$$\neg T = F$$

Definition of Boolean Expression.

(1) 0 1 x is Boolean Expression.

(2) If A & B are Boolean Expression & are

$$\begin{array}{c} (A+B) \\ (A \cdot B) \\ \bar{A} \end{array}$$

x y z

$$\Rightarrow \overline{(x+y) \cdot z} \quad ((\bar{x} \cdot y \cdot \bar{z}) + (\bar{y} \cdot z))$$

$$x \cdot y + z \equiv (x \cdot y) + z$$

Complement. : Compute expression under the — symbol and then take complement.

$$x \cdot y$$

$$x \cdot 1$$

$$xy$$

$$\cancel{xx} \quad x \cdot 1$$

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

$$(\overline{x+z}) y \overline{x}$$

$$x + 0 = x$$

$$x \cdot 1 = x$$

$$x + 1 = 1$$

$$x \cdot 0 = 0$$

$$\frac{(xy+1)z}{1 \cdot z}$$

"A" Boolean Algebra Set contains 0 + 1

Operations $- + \cdot$

Commutative
Associative
Distributive

Id: $x + 0 = x$
 $x \cdot 1 = x$

Inv: $x \cdot \overline{x} = 0$
 $x + \overline{x} = 1$

$$A = \{a, b, c\},$$

$$\Rightarrow P(A) = \{\emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}\}$$

$$\begin{array}{lcl} 0 & \equiv & \emptyset \\ 1 & \equiv & \{a, b, c\} \\ \cdot & \equiv & \cap \\ + & \equiv & \cup \\ - & \equiv & \bar{} \end{array}$$

$$\Rightarrow X + 0 = X$$

$$\{a, b\} \cup \emptyset = \{a, b\}.$$

$$X + \bar{X} = 1$$

$$\{a, b\} \cup \{c\} = \{a, b, c\}$$

$$X \bar{X} = 0$$

$$\{a, b\} \cap \{c\} = \emptyset$$