BOOLEAN ALGEBRA

Year 12 & Year 13 - Wednesday 1st February 2023

WHAT IS BOOLEAN ALGEBRA?

- Manipulating Boolean expressions.
- The same as mathematical algebra just with Boolean operators like OR, AND, NOT etc.

YOUR EXAM

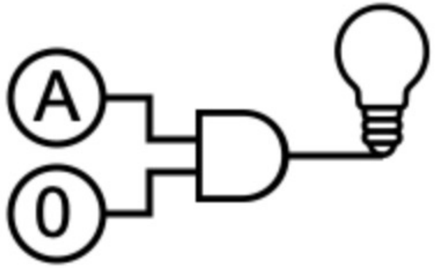
Content
Be familiar with the use of Boolean identities and De Morgan's laws to manipulate and simplify Boolean expressions.

$$\overline{A}$$

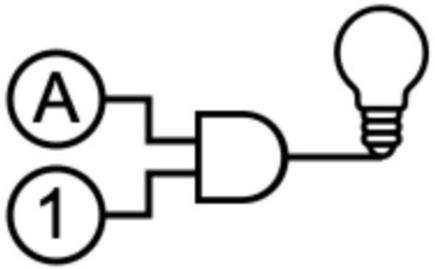
$$A.B$$

$$A + B$$

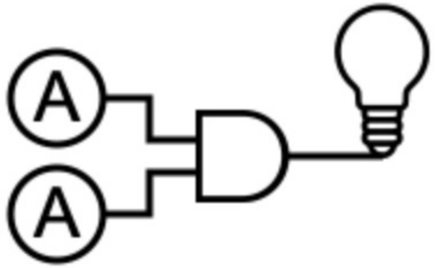
IDENTITIES



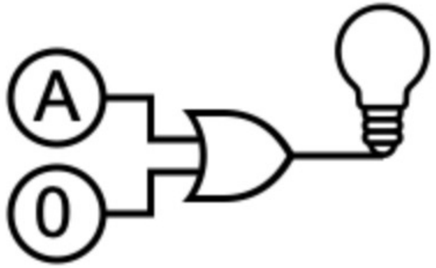
$$A.0 = 0$$



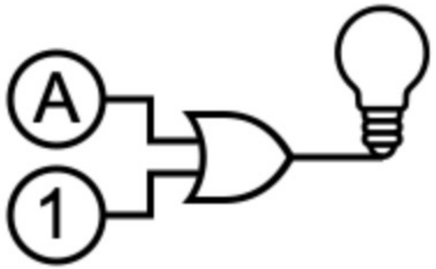
$$A.1 = A$$



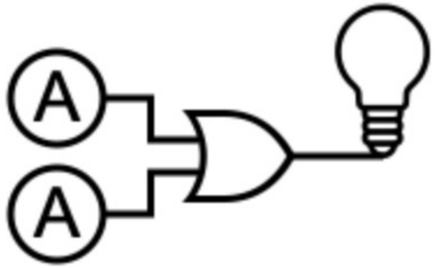
$$A.A = A$$



$$A + 0 = A$$



$$A + 1 = 1$$



$$A + A = A$$

DISTRIBUTION

$$x \times (y + z) = x \times y + x \times z$$

$$A.(B + C) = A.B + A.C$$

$$A + (B.C) = (A + B).(A + C)$$

DE MORGAN'S LAW

$$\overline{A + B} = \overline{A}.\overline{B}$$

"break the bar and swap the sign"

$$\overline{A.B} = \overline{A} + \overline{B}$$

EXAMPLE

$$A + \overline{\overline{B}.A}$$

$$A + \overline{A} + \overline{B}$$

$$1 + \overline{B}$$

$$1$$

EXAMPLE

$$C.B + \overline{C}.B$$

$$B.(C + \overline{C})$$

$$B.1$$

$$B$$