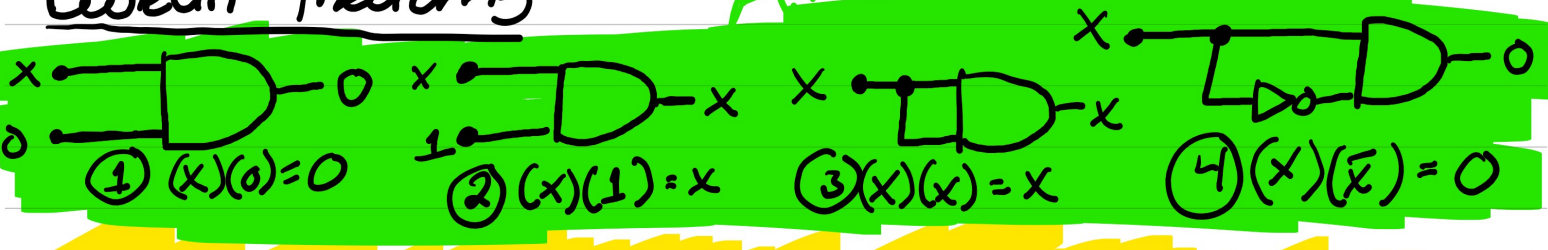
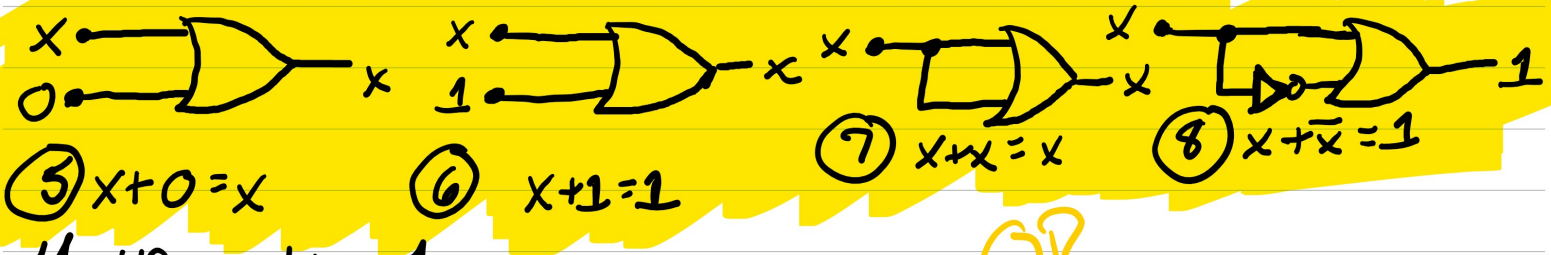
Boolean Theorems

AND



(1) $(x)(0)=0$ (2) $(x)(1)=x$ (3) $(x)(x)=x$ (4) $(x)(\bar{x})=0$



(5) $x+0=x$ (6) $x+1=1$ (7) $x+x=x$ (8) $x+\bar{x}=1$

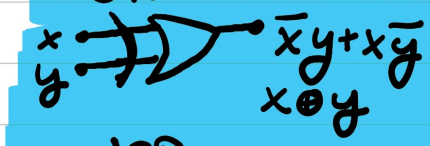
Multivariable Theorems

OR

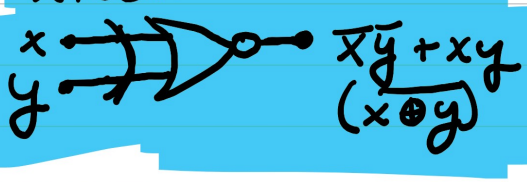
Commutative Law

(9) $x+y=y+x$ (10) $xy=yx$

XOR



XNOR



Associative Law

(11) $x+(y+z)=(x+y)+z=x+y+z$

(12) $x(yz)=(xy)z=xyz$

Distributive Law

(13a) $x(y+z)=xy+xz$ (13b) $(w+x)(y+z)=wy+xy+wz+xz$

De Morgan's Theorems

(14) $x+xy=x \Rightarrow x\cdot 1+x\cdot y=x(1+y)=x\cdot 1=x$

(15a) $x+\bar{x}y=x+y$

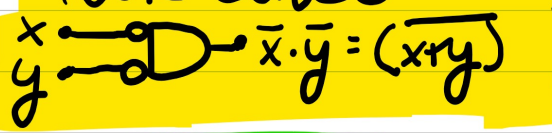
$\bar{x}$ 1 x $\bar{x}$

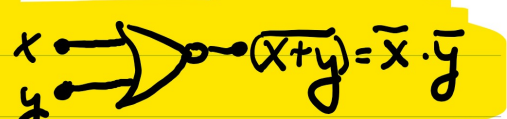
$\bar{x}+xy=\bar{x}+y$

(15b) $\bar{x}+xy=\bar{x}+y$

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

NOR Gates





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

NAND Gates