# Boolean Algebra Theorems

**Theorem 1** $X + XY = X$

**Theorem 2** $X + X'Y = X + Y$

**Theorem 3** $XY + X'Z + YZ = XY + X'Z$

**Theorem 4** $X(X + Y) = X$

**Theorem 5** $X(X' + Y) = XY$

**Theorem 6** $(X + Y)(X + Y') = X$

**Theorem 7** $(X + Y)(X' + Z) = XZ + X'Y$

**Theorem 8** $(X + Y)(X' + Z)(Y + Z) = (X + Y)(X' + Z)$

# DeMorgan's Theorems

1. Completement entire Expression

2. Complement each Term

3. Change operation from AND to OR or OR to AND

**Theorem 9** $(XYZ)' = X' + Y' + Z'$

**Theorem 10** $(X + Y + Z)' = X'Y'Z'$