

# 論理演算の初歩

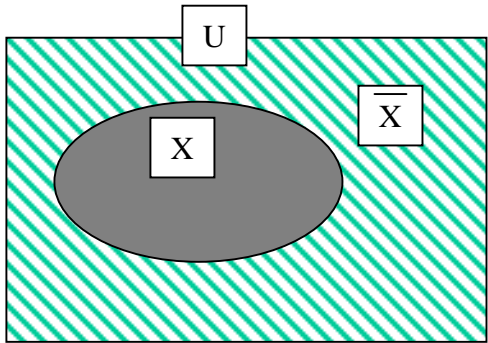
## 論理演算の初歩的な 公式についての解説図

### 記号

|   |
|---|
| <p><math>\cup, \cup, +</math>, 和集合を表す。<br/><math>\cap, \cap, \times, \bullet, \cdot</math>, 共有集合を表す。<br/><math>U, 1</math>, 集合全体を表す。<br/><math>\Phi, 0</math> 空集合を表す。</p> |
|---|

$$X \vee \bar{X} = U$$

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



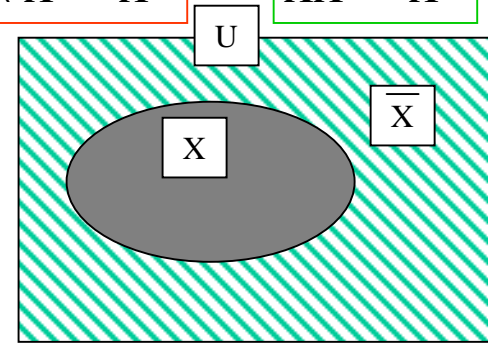
Xと $\bar{X}$ との和集合は全体

$$X \vee X = X$$

$$X + X = X$$

$$X \wedge X = X$$

$$XX = X$$

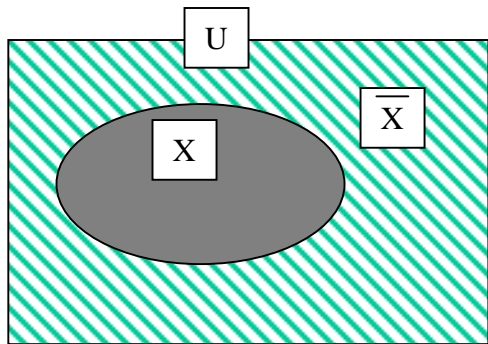


XとXとの和集合はX

XとXとの共有集合はX

$$X \wedge \bar{X} = \Phi$$

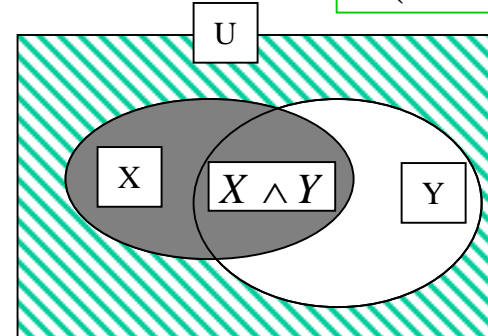
$$X \cdot \bar{X} = 0$$



Xと $\bar{X}$ との共有集合は空集合

$$X \vee (X \wedge Y) = X$$

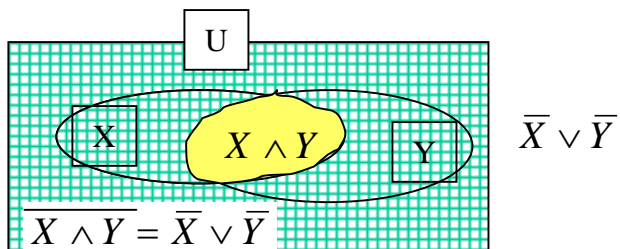
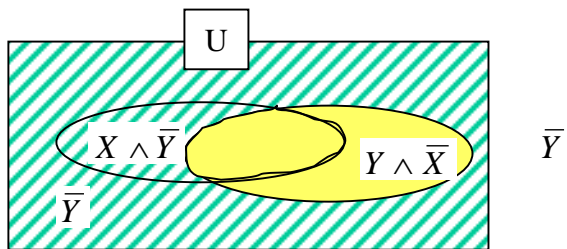
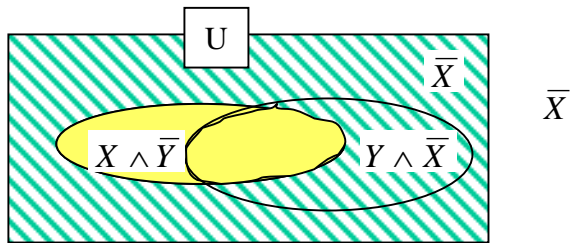
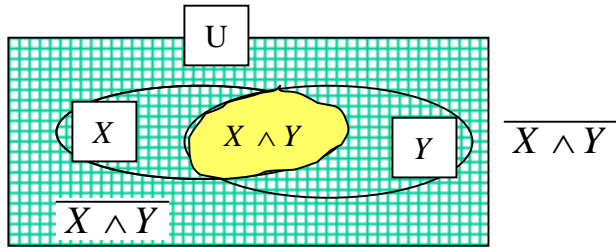
$$X + X \cdot Y = X, \\ X(1 + Y) = X$$



Xと(XとYの共有集合)との和集合はXに等しい(この共有集合はXの一部であるため)

$$\overline{X \wedge Y} = \bar{X} \vee \bar{Y}$$

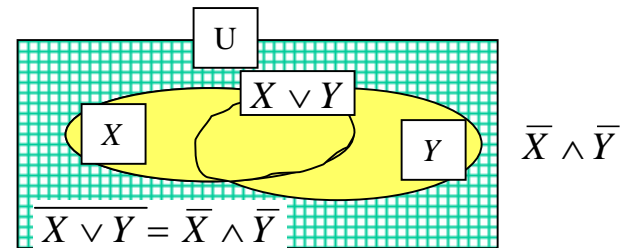
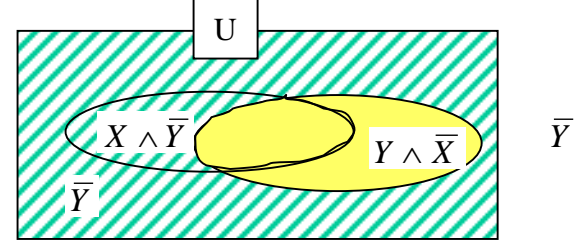
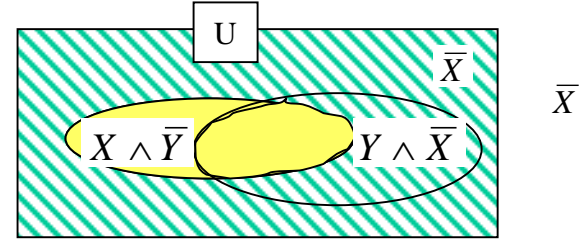
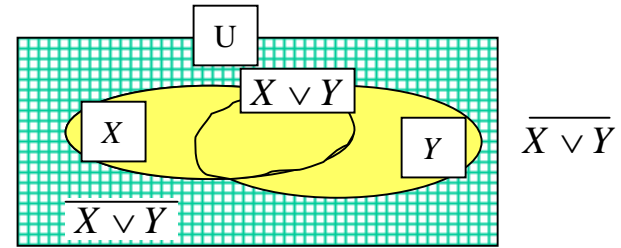
$$\overline{X \cdot Y} = \bar{X} + \bar{Y}$$



XとYとの共有集合の否定は  
Xの否定とYの否定の和集合に等しい

$$\overline{X \vee Y} = \bar{X} \wedge \bar{Y}$$

$$\overline{X + Y} = \bar{X} \cdot \bar{Y}$$



XとYとの和集合の否定は  
Xの否定とYの否定の共有集合に等しい