

$$1. (1) \neg(p \wedge Q \rightarrow Q)$$

0 0 0 0 1 0

0 0 0 1 1 1

0 1 0 0 1 0

0 1 1 1 1 1

矛盾式

$$(2) (p \rightarrow (p \vee Q)) \vee (p \rightarrow R)$$

0 1 0 0 0 1 0 1 0

0 1 0 0 0 1 0 1 1

0 1 0 1 1 1 0 1 0

0 1 0 1 1 1 0 1 1

1 1 1 1 0 1 1 0 0

1 1 1 1 0 1 1 1 1

1 1 1 1 1 1 1 0 0

1 1 1 1 1 1 1 1 1

重言式

$$(3) (p \vee Q) \rightarrow (p \wedge R)$$

0 0 0 1 0 0 0

0 0 0 1 0 0 1

0 1 1 0 0 0 0

0 1 1 0 0 0 1

1 1 0 0 1 0 0

1 1 0 1 1 1 1

1 1 1 0 1 0 0

1 1 1 1 1 1 1

可真可假

$$2. \neg(A \vee B) \quad \neg A \wedge \neg B$$

1 0 0 0 1 0 1 1 0

0 0 1 1 1 0 0 0 1

$$\begin{array}{cccc|cccc} 0 & 1 & 1 & 0 & 0 & 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 1 & 0 & 1 & 0 & 0 & 1 \end{array}$$

$$3.1.1) \quad P \rightarrow (Q \rightarrow R)$$

$$= P \rightarrow (\neg Q \vee R)$$

$$= \neg P \vee (\neg Q \vee R)$$

$$= (\neg P \vee \neg Q) \vee R$$

$$= \neg(P \wedge Q) \vee R$$

$$= (P \wedge Q) \rightarrow R$$

$$(2) \quad (\neg P \wedge (\neg Q \wedge R)) \vee (Q \wedge R) \vee (P \wedge R)$$

$$\neq (\neg P \wedge \neg Q) \wedge R \vee (Q \wedge R) \vee (P \wedge R)$$

$$= (\neg(P \vee Q) \wedge R) \vee (Q \vee P) \wedge R$$

$$= (\neg(P \vee Q) \vee (P \vee Q)) \wedge R$$

$$= R$$