Homework 3

23 April 2023 15:30

1.

a) $v(p) \neq v(q)$

$\phi : (p \vee q) \wedge (\neg p \vee \neg q)$

b) at least one of $\{v(p), v(q)\}$ is T

$\phi : p \vee q$

c) at most one of $\{v(p), v(q)\}$ is T

$\phi : \neg p \vee \neg q$

d) exactly one of $\{v(p), v(q)\}$ is T

$\phi : (p \vee q) \wedge (\neg p \vee \neg q)$

e) $\phi : p \vee q \vee r$

f) $\phi : \neg p \vee \neg q \vee \neg r$

g) $\phi : (\neg p \vee \neg q) \wedge (\neg p \vee \neg r) \wedge (\neg q \vee \neg r)$

h) $\phi : (p \vee q \vee r) \wedge (\neg p \vee \neg q) \wedge (\neg p \vee \neg r) \wedge (\neg q \vee \neg r)$

i) $\phi : (p \vee q) \wedge (q \vee r) \wedge (p \vee r)$

j) $\phi : \neg p \vee \neg q \vee \neg r$

k) $\phi : (p \vee q) \wedge (q \vee r) \wedge (p \vee r) \wedge (\neg p \vee \neg q \vee \neg r)$

2.

a) $\phi : (b_A \vee w_A) \wedge (\neg b_A \vee \neg w_A)$

$\psi : (b_B \vee w_B) \wedge (\neg b_B \vee \neg w_B)$

$(b_A \vee b_B) \wedge (w_A \vee w_B) \wedge \phi \wedge \psi$

3)

a)
+ Each city has one color
+ Suzu and Noto have different color
+ Suzu and Wajima "
+ Noto and Wajima "
+ Anamizu and Noto "
+ Anamizu and Wajima "