4. a)

X_1	X_2	X_3	$X_1 \vee X_2$	$X_1 \Rightarrow X_3$	$\neg X_2$	KB	α
T	T	T	T	T	F	F	T
T	T	F	T	F	F	F	T
T	F	T	T	T	T	T	T
T	F	F	T	F	T	F	F
F	T	T	T	T	F	F	T
F	T	F	T	F	F	F	T
F	F	T	F	T	T	F	T
F	F	F	F	T	T	F	F

$KB = (X_1 \vee X_2) \wedge (X_1 \Rightarrow X_3) \wedge \neg X_2$

$\alpha = X_3 \vee X_2$

$M(KB) \subseteq M(\alpha) \Rightarrow KB \models \alpha$

when KB is T, α is T

b)

X_1	X_2	X_3	$X_1 \vee X_3$	$X_1 \Rightarrow \neg X_2$	KB	α
T	T	T	T	F	F	F
T	T	F	T	F	F	F
T	F	T	T	T	T	T
T	F	F	T	T	T	T
F	T	T	T	T	T	F
F	T	F	F	T	F	F
F	F	T	T	T	T	T
F	F	F	F	T	F	T

$KB = (X_1 \vee X_3) \wedge (X_1 \Rightarrow \neg X_2)$

$\alpha = \neg X_2$

$M(KB) \not\subseteq M(\alpha) \Rightarrow KB \not\models \alpha$

when $X_1 = F$, $X_2 = T$, $X_3 = T$, KB is T but $\alpha = F$