

Name: My solution

1. (50 points) Determine if the following two statements are equivalent by comparing their truth tables: i) $P \Rightarrow (Q \Rightarrow R)$. ii) $(P \text{ AND } Q) \Rightarrow R$.

P	Q	R	$Q \Rightarrow R$	$P \Rightarrow (Q \Rightarrow R)$	$P \text{ AND } Q$	$(P \text{ AND } Q) \Rightarrow R$
T	T	T	T	T	T	T
T	T	F	F	F	T	F
T	F	T	T	T	F	T
T	F	F	T	T	F	T
F	T	T	T	T	F	T
F	T	F	F	T	F	T
F	F	T	T	T	F	T
F	F	F	T	T	F	T

SAME

The statements i) and ii) are equivalent because they have the same truth table.

2. (50 points) Negate the expression and simplify: $\exists x, (P(x) \Rightarrow Q(x))$.

$$\forall x, \text{Not } (P(x) \Rightarrow Q(x))$$

$$\forall x, P(x) \text{ AND } (\text{Not } Q(x))$$