Simple Symbolization

1. Examples

P: Steve had fried chicken.
Q: Steve had French fries.
R: Steve had salad.
S: Steve had mashed potatoes.

要两个. 要求高. 交集.

任一个即可. 所以并一起. ∈

Steve had fried chicken and French fries.	$P \wedge Q$
Steve had both French fries and mashed potatoes	$Q \wedge S$
Steve did not have salad.	$\sim R$
Steve had either French fries or salad.	$Q \vee R$
Steve had fried chicken and did not have French fries.	$P \wedge \sim Q$
Steve had fried chicken but did not have french fries.	$P \wedge \sim Q$

e.g. Steve had fried chicken and mashed potatoes or French fries.

Two things:

be careful of those 'comma's.

Either Steve had fried chicken and mashed potatoes, **or** Steve had French fries.

$(P \wedge S) \vee Q$

Steve had fried chicken, **and** either Steve had mashed potatoes or French fries.

$P \wedge (S \vee Q)$

When proving they are not the same: using the truth table.

P	S	Q	$(P \wedge S)$	$(P \wedge S) \vee Q$	$(S \vee Q)$	$P \wedge (S \vee Q)$
T	T	T	T	**T**	T	**T**
T	T	F	T	**T**	T	**T**
T	F	T	F	**T**	T	**T**
T	F	F	F	**F**	F	**F**
F	T	T	F	**T**	T	**F**
F	T	F	F	**F**	T	**F**
F	F	T	F	**T**	T	**F**
F	F	F	F	**F**	F	**F**

$(P \wedge S) \vee Q$ and $P \wedge (S \vee Q)$ arent
equivalent.

e.g. Steve had neither French fries nor
mashed potatoes.

$\sim(P \vee Q)$ $\sim P \wedge \sim Q$

P	Q	~P	~Q	PvQ	~(PvQ)	~P∧~Q
T	T	F	F	T	F	F
T	F	F	T	T	F	F
F	T	T	F	T	F	T
F	F	T	T	F	T	T

They are equivalent.