

7.20

4.

$\text{hasParty}(\text{Tweedledee}) \leftrightarrow \text{hasParty}(\text{Tweedledum})$

$\text{hasParty}(X)$ means “X gets a party”

5.

$\text{wentConcert}(X,Y)$ This means X and Y went to concert togeth.

$\text{Likes}(X,Y)$ This means X likes Y.

So, the answer is:

$\text{wentConcert}(X,Y) \rightarrow (\text{Likes}(X,Y) \wedge \text{Like}(Y,X)).$

7.21

Set P as “Keanu Reeves is a great actor” and $\sim P$ is “Keanu Reeves is not a great actor”.

Set Q as “I am a monkey’s uncle” and $\sim Q$ is “I am not a monkey’s uncle”.

The truth table is:

P	Q	$P \rightarrow Q$
1	1	1
1	0	0
0	1	1
0	0	1

Since Q is always false, so it follows that P is not true.

Why is “ $A \rightarrow \perp$ ” equivalent to “ $\sim A$ ”

Truth table:

A	$A \rightarrow \perp$	\perp	$\sim A$
1	0	0	0
0	1	0	1