**Logical equivalence, De Morgan's laws, contradictions and tautologies**

**Logical equivalence**

Two logical statements are logically equivalent if they always produce the same truth value.

So if two logical statements have the same values in a truth table, they will be logically equivalent

**Tautologies**  
A statement is a tautology when it is TRUE regardless of the truth of  
individual elements e.g

“We are going to the cinema tomorrow or we are not going to the cinema tomorrow”

Same as p OR ~p. – always true

**Contradictions**

A statement is false even though some part of it might be true:

“we are going to the cinema tomorrow and we are not going to the cinema tomorrow”

Same as p AND ~p. – always false

**De Morgan’s laws TODO**