1 De Morgan's Laws

The De Morgan's Laws allow the expression of conjunctions and disjunctions purely in terms of each other via negation.

The laws can be verbalized as:

- The negation of a conjunction is the disjunction of the negations.
- The negation of a disjunction is the conjunction of the negations.

The Rules can be verbalized as

(i) "not (A and B)" is the same as "(not A) or (not B)"

(ii) "*not (A or B)*" is the same as "*(not A) and (not B)*"

Use Truth Tables to prove De Morgan's Laws (see page 40).

$$\neg(p \vee q) = \neg p \wedge \neg q$$

p	q	$p \vee q$ (1)	$p \wedge q$ (2)	$\neg(p \vee q)$ (3)	$\neg(p \wedge q)$ (4)
0	0	0	0	1	1
0	1	1	0	0	1
1	0	1	0	0	1
1	1	1	1	0	0

p	q	$\neg$p (5)	$\neg$q (6)	$\neg p \wedge \neg q$ (7)	$\neg p \vee \neg q$ (8)
0	0	1	1	1	1
0	1	1	0	0	1
1	0	0	1	0	1
1	1	0	0	0	0