The *DeMorgan Laws* appear in various forms in logic and set theory. In the context of MA361 we will state them as follows:

Suppose P and Q are propositions. Then

$$\sim (P \vee Q) \equiv \sim P \wedge \sim Q \tag{1}$$

and

$$\sim (P \wedge Q) \equiv \sim P \vee \sim Q \tag{2}$$

Recall that the symbol "$\sim$" denotes negation. The symbol "$\equiv$" is read "is logically equivalent to".

The DeMorgan laws are very useful when you are working with negations in symbolic logic or with compliments in set theory. In MA361 we will use both the logical and set theoretic versions.

In the context of set theory, they might be stated as follows: Suppose A and B are sets. Then

$$(A \cup B)^c = A^c \cap B^c \quad \text{and} \quad (A \cap B)^c = A^c \cup B^c$$

1. The Assignment

Establish one of the DeMorgan laws [either equivalence (1) or equivalence (2), your choice] using truth tables.

Starting with the truth table for P and Q

P	Q
T	T
T	F
F	T
F	F

add add columns and/or successive truth tables to produce the truth values for the left and right hand sides of the equivalence you have chosen.

You should format your argument using LaTex. When you have completed it, submit the sourse (.tex) file via email.

You can use the LaTeX document *example2.tex* which is posted under "Miscellaneous expressions" in the **Examples** section of the LaTeX resource page

http://www.sandgquinn.org/stonehill/latex/index.html

as a starting point.

If you need to know the code for a symbol you can usually find it by entering "LaTeX math symbols" on Google.