# Logic & Set Theory

## 3.AB PreIB Maths – Mock Exam

Unless specified otherwise, you are to **always** (at least briefly) explain your reasoning. Even in closed questions.

1. Logic – propositions and conjunctions.

   a) Supposing a proposition $p$ is false and another proposition $q$ is also false, is the proposition [10 %]

   $$(p \Rightarrow q) \vee q$$

   true or false? **Explain**.

   b) Fill the propositions $p$ and $q$ (you may not need both) in the blanks so that the proposition [10 %]

   $$(\neg p \Rightarrow \square) \Leftrightarrow (\square \vee q)$$

   is **always** true independently of whether $p$ and $q$ are themselves true or false.