Homework 3 – Part B.

1. Prove that the following arguments are valid. You may use any of the Stage 1 rules of inference (MPP, MTT, DN, &I, &E, ∨I), plus the Rule of Assumptions (A) and Reductio ad Absurdum (RAA).

   (a) (1) $-(P \vee Q)$ / $-P \,\&\, -Q$

   (b) (1) $-P \rightarrow Q$ / $P \vee Q$

2. Prove that the following arguments are valid. You may use any of the Stage 1 rules of inference plus the Rule of Assumptions (A) and ∨-Elimination (∨E).

   (a) (1) $R \vee S$
   (2) $-P \rightarrow -R$
   (3) $S \rightarrow Q$ / $Q \vee P$

   (b) (1) $P \vee Q$
   (2) $P \vee R$ / $P \vee (Q \,\&\, R)$

3. Prove that the following arguments are valid. You may use any of the rules of inference that we have learned.

   (a) (1) $(P \rightarrow Q) \vee (P \rightarrow R)$ / $P \rightarrow (Q \vee R)$

   (b) (1) $(P \rightarrow Q) \rightarrow Q$ / $P \vee Q$