

Tutorial Worksheet 4

1) Consider the following two statements:

$R =$ “For any real number x , there is a real number y , such that $x + y < 1$.”

$S =$ “There is a real number y , such that for any real number x , we have $x + y < 1$.”

(a) Write both statements using logic symbols.

(b) Write the negation of R and S . Use the the logic symbols, but do not use the symbols \neg and $\not\prec$.

(c) Is R a true or a false statement? Is S a true or a false statement? Explain.

2) Let P , Q , R and S be four statements. If $[(P \wedge Q) \vee R] \Rightarrow (R \vee S)$ is a false statement, what must be the truth values of P , Q , R and S ? Why?

3) Construct the truth table of the following statements.

$$(P \Rightarrow Q) \Rightarrow (P \wedge Q)$$