CS2022/MA2201
HW#4

DUE: Monday, September 24

1. (4 points) Explain whether or not either of the following arguments are valid, where a valid argument

$$\begin{array}{l} A_1 \\ A_2 \\ \ldots \\ A_n \\ \therefore B \end{array}$$

means that B must be true whenever $A_1,\ldots,A_n$ are all true.

a

$$\begin{array}{l} p \to r \\ q \to r \\ \neg(p \vee q) \\ \therefore \neg r \end{array}$$

b

$$\begin{array}{l} p \to r \\ q \to r \\ q \vee \neg r \\ \therefore \neg p \end{array}$$

2. (6 points) Use mathematical induction to prove that $2 \mid \left(n^2 + 5n\right)$ for all $n \geq 0$.

3. (6 points) Use mathematical induction to prove that for any n ($n \geq 3$) nonparallel lines in the plane in general position, at least one of the regions they form must be a triangle.