

Math 2534:
Examples of Valid and Invalid Arguments

Problem 1:

Determine if the following arguments are valid. Explain and justify your conclusion. (You need to define all variables used_ Due to time I will not define each one)

- 1) If Fred goes to the dance then so will Jane. Jane did go.
Therefore Fred must have gone.

$$\begin{array}{l} F \rightarrow J \\ J \\ \therefore F \end{array}$$

Not Valid since necessary condition does not guarantee sufficient condition.
Converse error.

- 2) If it rains then the game is off. It did not rain.
Therefore the game was played.

$$\begin{array}{l} R \rightarrow \sim G \\ \sim R \\ \therefore G \end{array}$$

Not Valid since negative sufficient condition does not imply negative necessary condition. Inverse error.

- 3) If you do not pass the course then you did not study. You did study.
Therefore you did pass the course.

$$\begin{array}{l} \sim P \rightarrow \sim S \\ S \\ \therefore P \end{array}$$

Valid by contrapositive.

4) If the dog barks, then the mail is here. The dog did bark, so the mail is here.

$$D \rightarrow M$$

$$D$$

$$\therefore M$$

Sufficient condition is given so the necessary is guaranteed.