Solutions to In class worksheet

For 1-5 let H: study hard and P: pass the course

1) If you study hard, you will pass this course. $H \to P$

2) If you pass the course then you studied hard. $P \to H$

3) Only if you study hard will you pass the course. $P \to H$

4) You will pass this course if and only if you study hard. $P \leftrightarrow H$

5) You will pass this course if you study hard. $H \to P$

6) Ellen must cook or I will go out to eat.

Let O: go out to eat and C: Ellen cooks $O \vee C \equiv \sim O \to C$

7) I can pass this course only if Fred helps me.

Let P: pass this course and F: Fred helps $P \to F$

8) I will not swim if you do not swim.

Let P: I swim and Q: you swim $\sim Q \to \sim P \equiv P \to Q$

9) I eat ice cream only if it is chocolate.

Let I: I eat ice cream and C: chocolate $I \to C$

10) I will run or I will take a nap.

Let R: run and N: nap $R \vee N \equiv \sim R \to N$

11) I will be at the opera if and only if I got tickets.

Let O: opera and T:tickets $O \leftrightarrow T$

Mary tells her best friend, Jill, that she will go snow boarding only if Jill goes. Jill goes but Mary did not. Did Mary break her promise to Jill?

NO! Jill going is only the necessary condition and does not guarantee the sufficient condition of Mary going.

Consider the following statements:

p: Frank is a freshman

q: Erica is from New Jersey

r: Lester has graduated.

Given that the statement $(p \vee \neg r) \rightarrow (q \wedge p)$ is a false statement and r is true. Find the values for p and q.

Solution: r is true so $\neg r$ is false. The implication is false which means that the sufficient condition is true and the necessary condition is false. If the sufficient condition $(p \vee \neg r)$ is true and is a disjunction, p is true. The necessary condition $(q \wedge p)$ is false and is a conjunction. Since p is true then q must be false