Homework 1

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January 20, 2015

1. A-D are propositions, however only A and C are true.

3A. Mei does not have an MP3 player.

3B. There is pollution in New Jersey.

3C. $2 + 1 \neq 3$

9A. Sharks have not been spotted.

9B. Swimming is allowed or sharks have been spotted.

9C. Swimming is not allowed, or sharks have been spotted.

9D. If swimmng is allowed, sharks haven't been spotted.

9E. If sharks haven't been spotted, swimming is allowed.

9F. If swimming isn't allowed, no sharks have been spotted.

9G. Swimming is allowed if and only if there are no sharks.

9H. Swimming is not allowed, and no sharks have been spotted.

11A. $p \wedge q$

11B. $p \wedge \neg q$

11C. $\neg p \wedge \neg q$

11D. $p \vee q$

11E. $p \rightarrow q$

23A. If the wond blows from the northeast, it snows.

23B. If it stays warm for a week, the apple trees will bloom.

23C. If the Pistons beat the Lakers, they will win the championship.

23D. If you walk 8 miles, you will get to the top of Long's Peak.

23E. If you are world famous, you get tenure.

23F. If you drive more than 400 miles, you will need to buy gasoline

23G. If you bought your CD player less than 90 days ago, your guarantee is good.

23H. If the water is too cold, Jan will not go swimming.

27A. It will snow if I ski tomorrow, it didn't snow if I don't ski, if it doesn't snow I won't ski.

27B. It is a sunny day if I go to the beach, if I don't go to the beach it's not sunny, I stay home if it's not sunny.

27C. If I sleep until noon I've stayed up late, I didn't stay up if I don't sleep late, If I don't stay up late I wake up early.

31. See Back

33A. See Back

33B. See Back

5. See Back

6. See Back

15. This will always be true by virtue of the second implication.

16. In order for the first expression to be true, P and Q must be the same. The second side literally says, "They are both TRUE, or they are both FALSE."

27. In a $\rightarrow$, either both are true, both are false, or the first one is false and the second true. By including arrows going both ways as conditions, you're making the arrow double headed.

31. The p and $\neg p$ negate each other, leaving only $q \vee r$, which is what's on the other side.