CSCI 1900 - Homework 10-B

**Section 1.7, 1.8: Methods of Proof** *(28)*

In problems 1 through 5, give the symbolic form of the given argument, state whether the argument is valid or not. If it is valid, either state the name of a known form or give the truth table showing that it is a tautology. If it is not valid, give the truth table showing that it is **not** a tautology. **(3 points each)**

1. If it is springtime, then the weather is unpredictable.

 It is springtime.

 $∴$ The weather is unpredictable.

1. If it is night time, then the boogieman comes out.

 The boogieman comes out.

 $∴$ It is night time.

1. If it is payday, then I will party.

 It is not payday.

 $∴$ I will not party.

1. I will eat lunch or I will play tennis.

 I will not play tennis.

 $∴$ I will eat lunch.

1. If I fulfill all requirements, then I will get my degree.

 If I get my degree, then I will become rich.

 I will fulfill all requirements and I will party.

 $∴$ I will get rich.

1. Give the converse and the contrapositive of each of the following statements. **(2 points each)**
	1. If it is payday, then I will party.
	2. I am not awake implies that I am dreaming.
	3. If today is not a school day, then I go fishing.
	4. Getting a paycheck is necessary for me to not be broke.
2. Prove or disprove: The sum of an even number and an odd number is odd. **(1 point)**
3. Prove or disprove: For any positive integer *n*, if *n* is prime then *n* is odd. **(1 point)**
4. Prove or disprove: The difference of any two odd integers is odd. **(1 point)**
5. Prove or disprove: The difference of any two even integers is even. **(1 point)**
6. Given that n is an integer, prove that n2 is even iff (if and only if) n is even. **(1 point)**